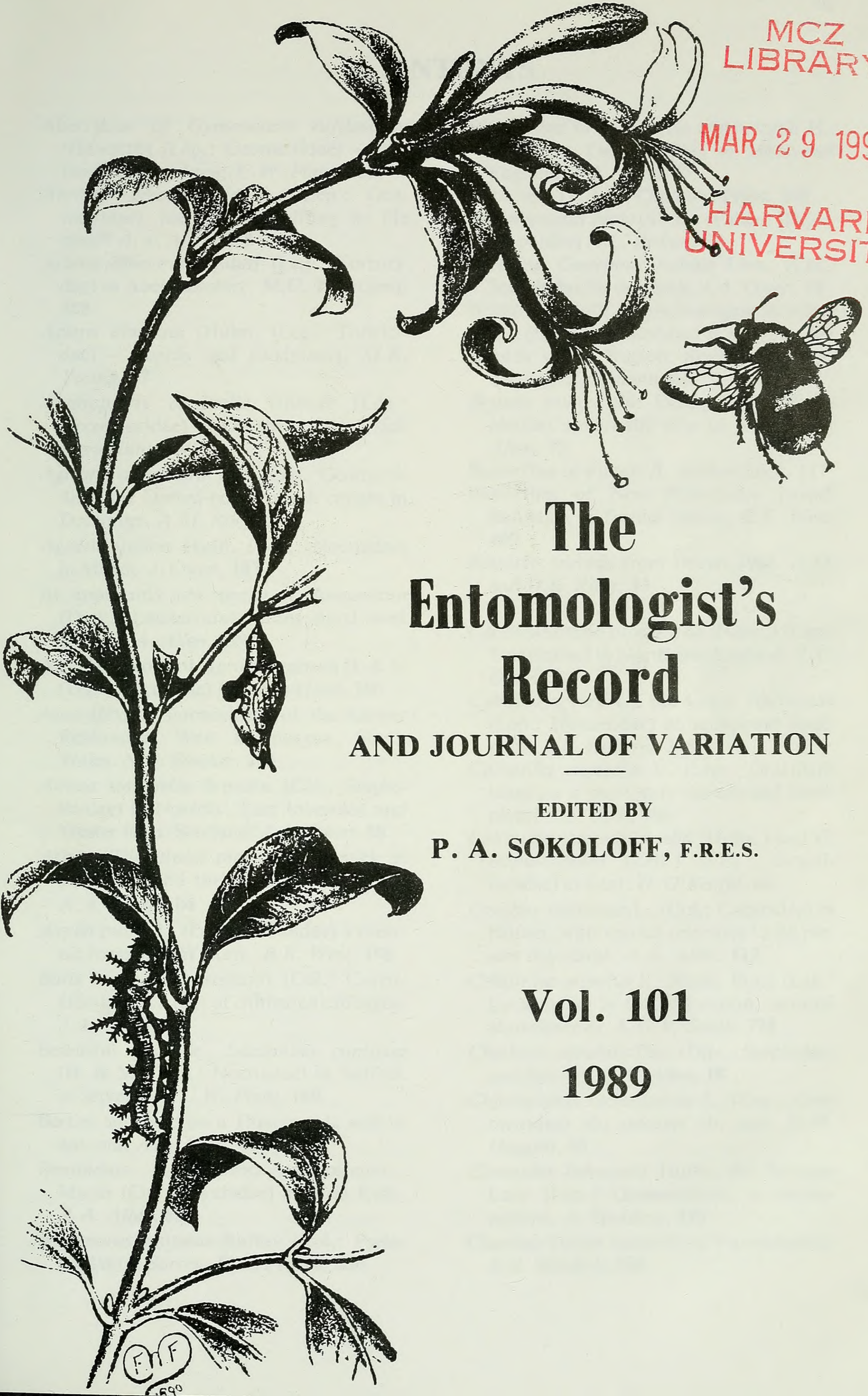

The Entomologist's Record

AND JOURNAL OF VARIATION

EDITED BY

P. A. SOKOLOFF, F.R.E.S.

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CONTENTS

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COMPARISON OF LIGHT-TRAP CATCHES IN DECIDUOUS AND CONIFEROUS WOODLAND HABITATS

P. Waring

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WITH reference to the paper by Drs Kearns and Majerus (1987) and the call for further research into comparisons of light trap catches in deciduous versus adjacent coniferous habitats, I have recently completed some fieldwork that is relevant. I am interested in the use of light traps as a possible means of monitoring the effects of habitat management on moths in nature reserves and elsewhere. At Bernwood Forest, on the Oxon/Bucks border, I had the opportunity of comparing an overgrown coppice plot with an adjacent plantation of conifers that had been established on an otherwise similar site. The two sites were separated only by a woodland path. It was also possible, at the same time, to compare another adjacent woodland plot in which coppicing had recently taken place. I offer some data to demonstrate the nature of the results I obtained. I would like to use these examples to draw attention to various factors that need to be considered when comparing light trap catches in different places.

It goes without saying that if two or more sites are to be compared they should be trapped simultaneously as there is much evidence to indicate that variations in weather, even on consecutive nights, have a major influence on the catch. The traps should also be operated for exactly the same length of time. When using a number of traps at the same time this is most easily achieved by operating from dusk to dawn using automatic photocell switches. This also enables late fliers and the pre-dawn flight to be incuded in the comparison. I used Heath traps (Heath 1965) operated from 14 amp-hour motorcycle batteries (a pair per trap in winter) because I regularly needed to trap six sites simultaneously and found that two or three Robinson traps (Robinson and Robinson 1950) was about my limit when it came to recording the entire catch in the morning at peak season without resorting to killing agents. Robinson traps are also cumbersome to operate when working single-handed in sites without mains electricity for each trap requires a generator and generally some maintenance during the night.

In this paper I am able to examine the results from a series of nights rather than from a single night in isolation. This reduces the influence of possible "odd" nights. It also provides for larger sample sizes so that statistical methods can be applied to individual species. It was possible to sample the sites on one night per week from January 1984 to December 1985 so that spring, summer, autumn and winter species could be involved in the comparison.

Site details

Figure 1 shows the location of the traps in Oakley Wood, which is in the north of Bernwood Forest. Figure 1 also summarises the major vegeta-

tional differences between the three sites in terms of structure and species composition. The conifer plantation (site C) was established in the 1950s by clearance of the scrub woodland and overgrown coppice that had developed on the site and that still remains on the adjacent area (site Br).

Part of the overgrown coppice woodland was coppiced again in a series of operations from the late 1970s onwards at site RC and regrowth has been impeded by the browsing of fallow deer, *Dama dama* L. The trap at Br was operated under a partial canopy of aspen and oak. At RC, less that 100 m away, the trap was operated by an oak tree in the centre of a coppiced plot that extended a minimum of 50 m in all directions. The third trap, at site C, was placed in a path through the conifer plantation and was approximately 500 m from Br.

Results

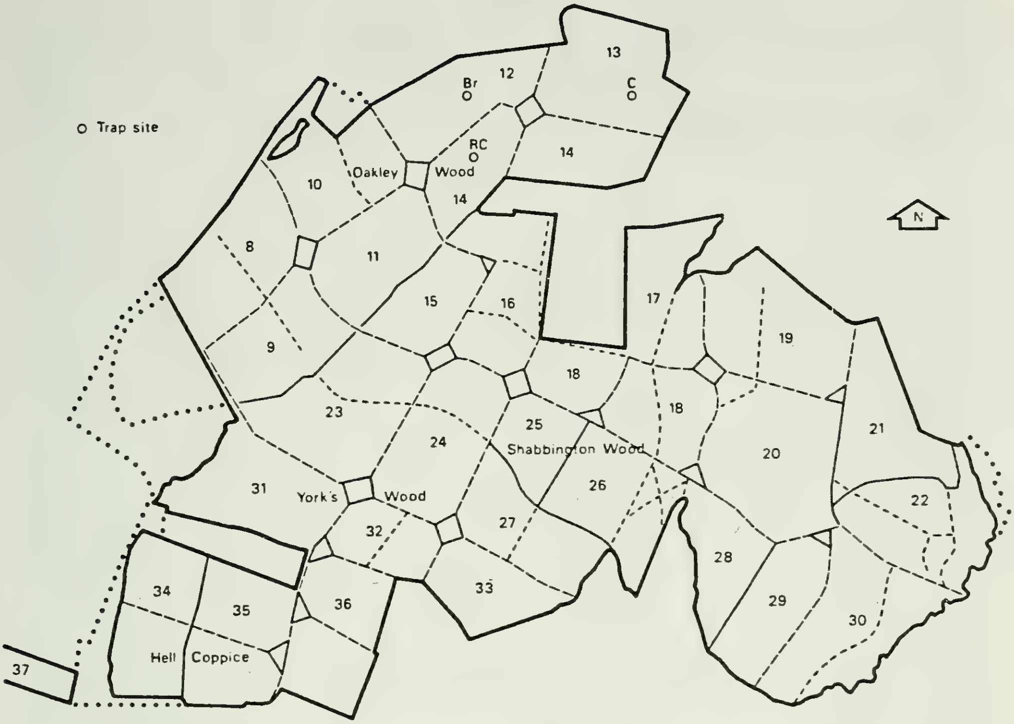
Table 1 shows the total number of moths captured at each site in each year for all species that were recorded in large enough numbers for statistical analysis in both years. They are listed in order of their abundance at Br in 1984.

Analysis of the results

Bowden (1982) points out that the effectiveness of light traps in catching moths varies depending on whether they are operated in dark, shady conditions such as under the tree canopy or in open situations such as woodland rides and paths. This means that a straight comparison of the number of individuals of species X in different sites could be inadequate or misleading in some circumstances. There is no problem in habitats such as heaths and fens where none of the traps are screened from the night sky but in woodland the situation is different. An obvious example is a mature conifer plantation which is renowned for providing dark shady conditions, and Drs Kearns and Majerus note that conditions were lighter in the deciduous woodland that they examined. Bowden (1982) notes that night-time illumination levels under trce canopies have not been investigated and the low levels of light would be difficult to measure without sophisticated purpose-built equipment. Whether the background levels of the ultra-violet parts of the spectrum that are particularly effective in influencing moths vary in the same way as for visible light is not known. Bowden (1982) found that the ratios of particular catches in his traps agreed with his estimates of trap effectiveness based on published work on daytime measurements of visible light levels.

Figure 1a: The locations of the three trap-sites in Oakley Wood which is in the north of Bernwood Forest.

Figure 1b: Changes in vegetation resulting from coppicing and conifer planting in Oakley Wood.


O Trap site
Br
C
RC
Oakley Wood
Shabbington Wood
York's Wood
Hell Coppice
N
8
9
10
11
12
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14
15
16
17
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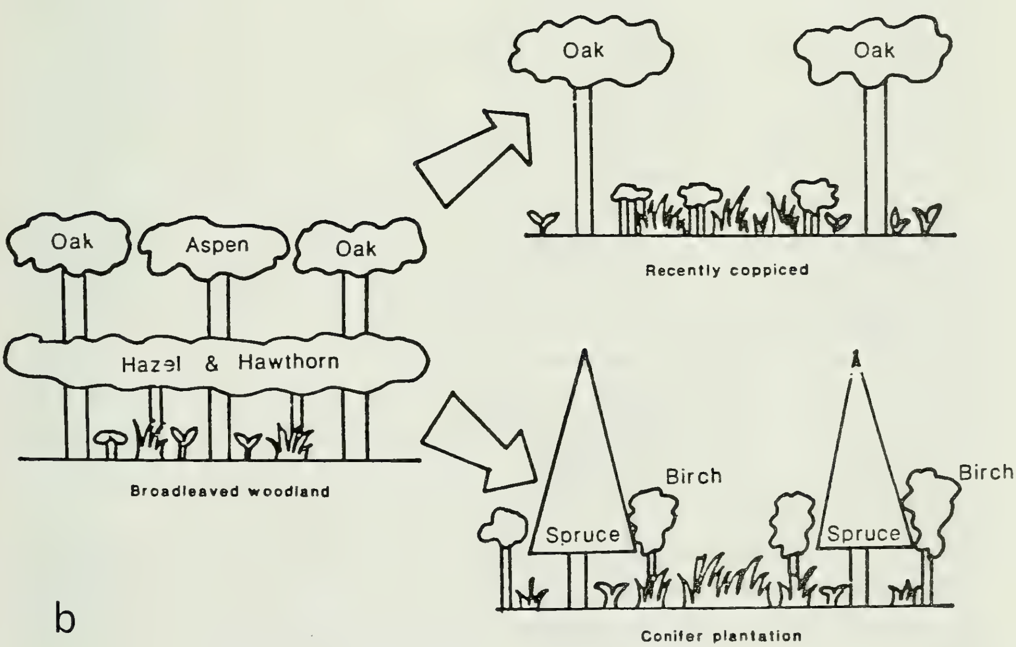
Oak
Aspen
Oak
Hazel & Hawthorn
Broadleaved woodland
Oak
Oak
Recently coppiced
Spruce
Birch
Spruce
Birch
Conifer plantation

b

TABLE 1

The numbers of moths captured as a result of simultaneous trapping on one night per week at three sites in Bernwood Forest for two years.

The sites are C, a conifer plantation. Br, an overgrown coppice woodland, and RC, a recently coppiced plot.

		1984			1985		
Common Name	**Scientific Name**	**C**	**Br**	**RC**	**C**	**Br**	**RC**
Mottled Beauty	*Alcis repandata*	147	234	15	180	227	19
Large Yellow Underwing	*Noctua pronuba*	88	212	31	11	23	7
Spring Usher	*Agriopis leucophaearia*	12	102	89	1	11	10
Small Quaker	*Orthosia cruda*	22	98	60	42	78	31
Dunbar	*Cosmia trapezina*	7	72	10	3	40	9
Feathered Thorn	*Colotois pennaria*	13	66	49	15	46	10
Small Brindled Beauty	*Apocheima hispidaria*	0	65	56	0	19	9
Riband Wave	*Idaea aversata*	31	62	14	21	37	10
Hebrew Character	*Orthosia gothica*	46	61	36	19	12	10
Maiden's Blush	*Cyclophora punctaria*	15	55	27	7	23	4
Winter Moth	*Operophtera brumata*	13	51	41	15	37	35
July Highflyer	*Hydriomena furcata*	22	51	8	15	53	2
Willow Beauty	*Peribatodes rhomboidaria*	157	49	24	87	16	7
Pale Oak Beauty	*Serraca punctinalis*	12	45	7	4	19	5
March Moth	*Alsophila aescularia*	28	43	25	10	18	4
Engraileds	*Ectropis bistortata* and *E. crepuscularia*	14	42	8	11	24	5
Dotted Border	*Agriopis marginaria*	18	41	17	21	25	4
Common Quaker	*Orthosia stabilis*	9	39	47	8	22	9
November Moths	*Epirrita* (3 species)	13	38	31	22	31	22
Chestnut	*Conistra vaccinii*	9	33	20	8	28	18
Brindled Beauty	*Lycia hirtaria*	8	32	15	3	14	19
Green-brindled Crescent	*Allophyes oxycanthae*	13	32	9	15	40	12
Common Swift	*Hepialus lupulinus*	133	29	10	75	13	9
Light Emerald	*Campaea margaritata*	6	28	1	3	10	0
Copper Underwings	*Amphipyra pyramidea* and *A. berbera*	5	25	1	6	22	4
Mottled Umber	*Erannis defoliaria*	15	25	15	6	17	4
Clouded Drab	*Orthosia incerta*	13	23	12	13	28	8
Small Fanfooted Wave	*Idaea biselata*	6	22	10	5	23	2
Figure of Eight	*Diloba caerulocephala*	4	22	19	7	21	15
Poplar Hawk	*Laothoe populi*	1	20	5	3	22	3
Heart and Dart	*Agrotis exclamationis*	15	19	23	1	33	12
Shoulder Stripe	*Anticlea badiata*	17	19	5	26	22	6
Dark Arches	*Apamea monoglypha*	36	16	4	21	19	3
Great Prominent	*Peridea anceps*	5	16	19	2	6	24
Ingrailed Clay	*Diarsia mendica*	10	15	0	25	20	11
Streamer	*Anticlea derivata*	15	15	2	18	8	5
Sprawler	*Brachionycha sphinx*	0	13	5	0	14	4
Mouse	*Amphipyra tragopoginis*	35	12	3	11	5	3
Scarce Umber	*Agriopis aurantiaria*	8	11	7	9	19	8
Chocolate Tip	*Clostera curtula*	4	11	4	0	15	3
Pale Oak Eggar	*Trichiura crataegi*	6	10	3	10	17	21
Oak Lutestring	*Cymatophorima diluta*	3	10	9	5	14	16
Early Grey	*Xylocampa areola*	16	10	3	39	28	6
Small Dotted Buff	*Photedes minima*	9	9	17	6	6	21
Frosted Green	*Polyploca ridens*	3	8	9	3	12	9
Brown Rustic	*Rusina ferruginea*	14	6	14	16	10	16
Common Footman	*Eilema lurideola*	56	4	24	18	2	9
Tawny-barred Angle	*Semiothisa liturata*	28	3	4	44	1	1
Grey Pine Carpet	*Thera obeliscata*	29	1	5	29	1	7

To make some allowance for the effects of light levels in different woodland situations, I measured the light at dawn at various times of the year using a photographic light meter. In the winter, when deciduous trees had lost all or most of their leaves, there was no appreciable difference between readings taken at the three sites. However, if moths are drawn to the trap from distances of up to 200 m, as suggested by Bowden, the darker conditions between the rows of conifers could make the trap here more effective than elsewhere.

Once the tree canopy was in full leaf (from mid May to early October) light measurements indicated that there was normally a difference of two f-stops on the photographic light meter, between the overgrown site Br and the other two sites, *ie* only a quarter of the light. This means that, on average, the trap at Br could be twice as effective assuming that the understorey of hazel and hawthorn at this site does not screen the trap and reduce its effective radius. This difference in effectiveness is given by Bowden's formula which is simply that:

$$\text{number of moths trapped} = \text{constant} \times \sqrt{1/I}$$

where I is the background illumination and the factors remaining constant include the number of moths available, their activity and the brightness of the trap light.

The difference in trap effectiveness can be incorporated into the comparison of the sites in the following way. If the trap in the overgrown woodland is twice as effective during the summer, a species that flies at this time must be more than twice as common at this trap before it can be regarded as actually commoner in reality in the overgrown woodland. If it is only slightly more than twice as common in the catch, this could be just due to chance. If it is four times as commonly trapped as elsewhere, this is good evidence that the species is more common here.This is the principle of the chi-squared test which I have applied to the data in Table 1. For each species I have compared the numbers of moths trapped with the numbers expected on the basis of the relative effectiveness of the traps *ie* 2:1 for comparisons of Br with C or RC between mid May and early October, 1:1 at other times. Where the difference between the observed ratio and the expected is sufficiently large that we can be 95% certain of a real difference between the sites, we have a statistically significant result.

Figure 2 shows those species of moth which are significantly commoner or rarer in the conifer plantation and in the recently coppiced area compared with the overgrown woodland. Many species are rarer in the catches in the conifer plantation (Table 1) but are not sufficiently rare that there is only a 5% probability of this being a chance result, and the same is true for the coppiced plot. In other words, this test is a pretty stringent one.

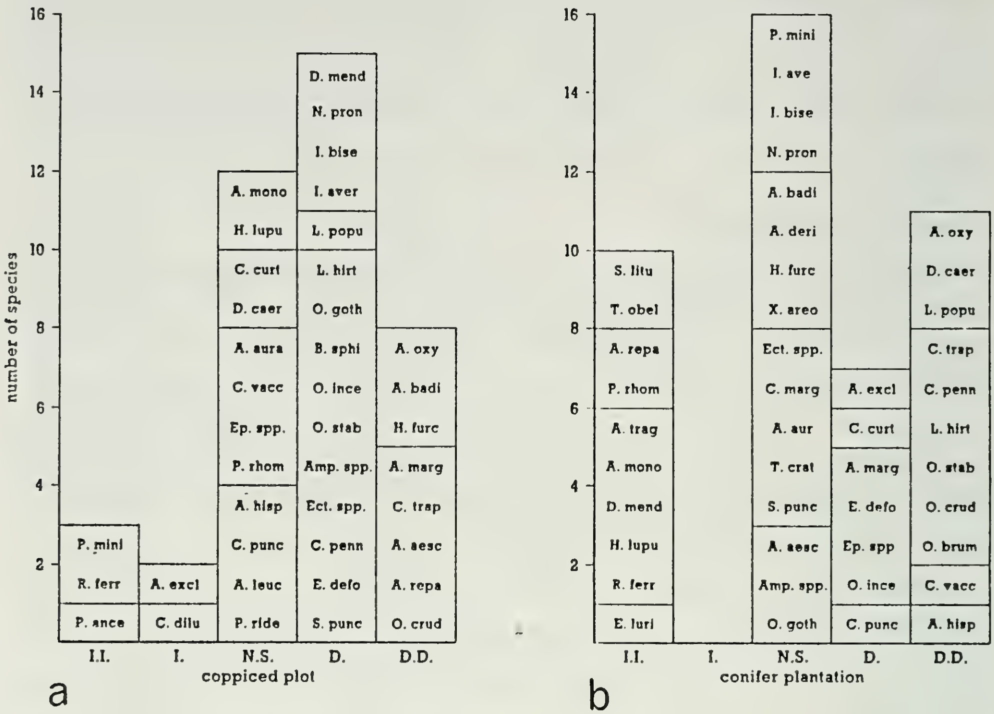

Figure 2: the responses of some common species of moth to—
a. recent coppicing
b. conifer planting

In both cases, the numbers of each species were compared with the numbers trapped in an adjacent area of overgrown woodland where these operations had not taken place (see Table 1).

If the number of moths trapped was significantly higher than in the overgrown woodland in both years the species was placed in the first column, II.

If the number was significantly higher only in one year, the species appears in the second column, I.

Species showing no significant difference in either year appear in the third column, NS.

Species with significantly lower numbers in the managed areas appear in column D or DD depending on whether a significant result was obtained in one or both years respectively.

Allowance was made for differences in the degree of shading at the sites as explained in the text.

The names of the species are abbreviated versions of the scientific names given in Table 1.

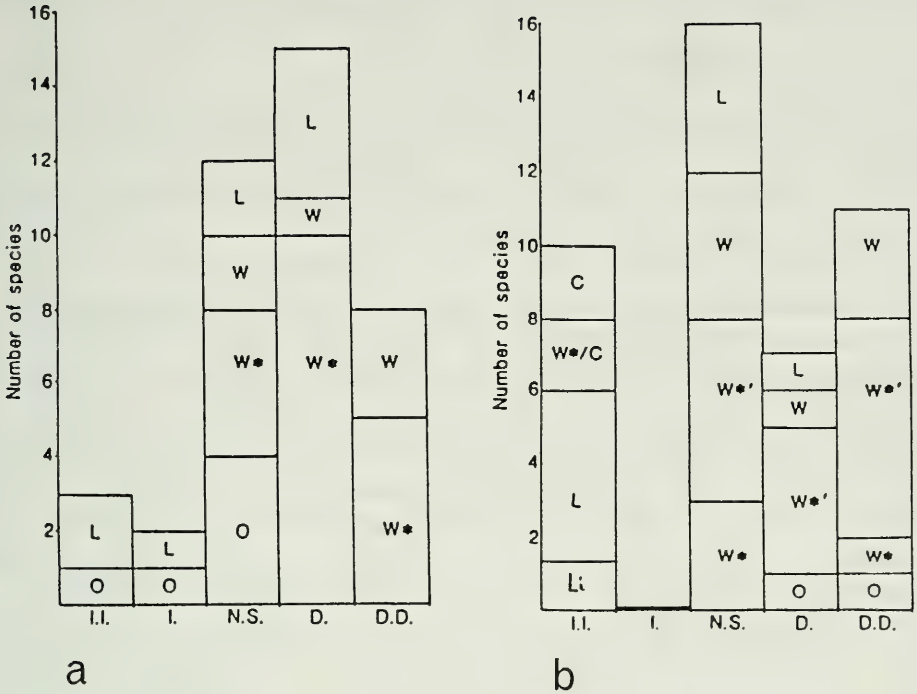

Figure 3: The responses of some common species of moth to—
a. coppicing
b. conifer planting

The species are arranged as in Fig. 2 but are categorized according to larval foodplant (see text for explanation of the categories).

Interpretation of the analysis

As a consequence of the wide interest in the British macrolepidoptera over the last two centuries, we are in a better position with regard to interpreting these results than we would be for most other insect groups, for the foodplants and habits of the macro-moths are comparatively well-known. However, we must not be complacent. There are many gaps in our knowledge of what larvae do on particular sites and light trap catches should be interpreted against a background of larval work on the site wherever possible. For example, in Bernwood the Mottled Beauty, *Alcis repandata* is one of the more common larvae on Norway spruce, *Picea abies* although conifers are not specifically mentioned as foodplants by Skinner (1984) or Carter and Hargraves (1986). This discovery is very relevant when attempting to explain why the moth is significantly more common in the conifer plantation than elsewhere both in 1984 and 1985. Fortunately it was possible to conduct a programme of work on the larvae at Bernwood at the same time as the light trapping.

For brevity, the species in Figs. 2 and 3 have been categorized according

to the type of foodplant the larvae exploit, using data drawn from Oakley Wood wherever possible. The following broad categories are used:

O = oak specialist, larvae feed only on oak
C = conifer specialist, larvae feed only on conifers
W* = larvae feed on broadleaved woody perennials including oak
W = larvae feed on some broadleaved woody perennials but not oak
W*/C = larvae feed on woody perennials including both oak and conifers
L = larvae feed low down, on herbs or grasses
Li = larvae feed on lichens

Fig. 3 presents those species shown in Fig. 2 using the above categories.

It can be seen from Fig. 3 that the results conform broadly with expectations based on the changes in availability of the larval foodplants resulting from the conifer-planting and coppicing operations. For example, the Grey Pine Carpet, *There obeliscata* and the Tawny-barred Angle, *Semiothisa liturata,* both conifer specialists, are significantly more common at the conifier site in both years. The Mottled Beauty, *A. repandata* and the Willow Beauty, *Peribatodes rhomboidaria* are also significantly more common in the conifers. Both species feed on conifers as well as broadleaves but a tendency for the adults to select cover in areas of dense vegetation, as suggested by Kearns and Majerus, probably contributes to this result. Both species were less common in the recently coppiced plot than in the overgrown woodland, possibly because adult roosting sites as well as larval foodplants are removed by coppicing. Availability of suitable adult roosting sites is a likely explanation for the high numbers of the Large Yellow Underwing *Noctua pronuba* in the overgrown woodland in 1984. So far as I am aware this species feeds at ground level on herbaceous plants, which are more common in the rides, paths and in coppiced plots than in the overgrown woodland but in the summer of 1984 this partly migratory species (Bowden *et. al.* 1979) was frequently disturbed as adults amongst dry leaves and fallen branches in the overgrown woodland and less frequently in the tidier coppiced plot. The numbers in the conifer plantation, where there is also suitable ground cover, are not significantly different from in the overgrown woodland once trap effectiveness is taken into account.

Conversely, the Maiden's Blush, *Cyclophora punctaria,* and the Small Brindled Beauty, *Apocheima hispidaria* which are oak specialists are significantly less common in the conifer plantation where many of the oaks have been removed. In the recently coppiced area, oak is the main tree species and two oak specialists, the Great Prominent, *Peridea anceps* and the Oak Lutestring, *Cymatophorima diluta* were commoner here than elsewhere. This is an interesting result for there has been no increase of oak as a result of the coppicing — the total amount is roughly the same as in the overgrown woodland, the two areas being managed as one prior to the coppicing. However, during the coppicing operation, birch and aspen trees

were removed as well as the shrub layer below all the trees. I suggest that the apparent increase in oak specialists after coppicing is due to the removal of other vegetation which would screen the trap from the oak canopy, the traps being operated on the ground. A previous study (Stradling *et al* 1983) concluded that bushy vegetation does have a screening effect. If this is the case, the relative effectiveness of the trap in the overgrown woodland is over-estimated and the decline of species resulting from conifer planting and coppicing are more severe than shown in Figs. 2 and 3. Significant declines would be registered for some of the species that are presently borderline cases and occupy the central columns of the two Figures.

Another possibility is that the oaks in the coppiced plot support higher densities of larvae than in the overgrown woodland. This is not supported by larval counts although these were limited due to the inaccessibility of most of the oak canopy. Species which feed as larvae on woody perennials other than oak or conifers were generally less common in the coniferous and coppiced areas than in the overgrown woodland, many significantly so (Fig. 2), as expected.

The category of species which feed on grasses or low plants is a diverse one. There are certainly more grassy places among the conifers than in the overgrown woodland at present which explains why the Dark Arches, *Apamea monoglypha* and the Common Swift, *Hepialus lupulinus,* are more common here — the larvae of the latter feed on the roots of grasses and the adults of both species were frequently seen in the grassy patches laying eggs. Tussock grass, *Deschampsia cespitosa* has invaded the coppiced plot and the distribution of the Small Dotted Buff *Photedes minima* reflects this. The larvae live in the stems (Skinner 1984). The Brown Rustic, *Rusina ferruginea,* which is also significantly more common in the coppiced plot, is said to feed on various low plants (Skinner 1984) although I have not come across larvae myself.

The Small Fan-footed Wave, *Idaea biselata* and the Riband Wave, *Idaea aversata* were both significantly less common after the coppicing in one of the two years. This may be because they prefer more sheltered situations which fits in with observations of the flying insects at dusk. Both species probably feed on a wide variety of low plants that grow in such situations (Skinner 1984). Many species that feed on herbs were not trapped frequently enough for inclusion in the statistical analysis.

Conclusion

In the past, light traps have been used mainly to find out which species of moths occurred on a site.The above results and those of Kearns and Majerus (1987) suggest a potential for detecting differences between adjacent habitats such as may be produced by deliberate management on a relatively small scale. Woodland situations are likely to be the most challenging because of variations in the amount of shading and screening

of the traps by vegetation. Careful choice of sites and methods such as that given above may help to overcome these problems.

Indications are that predictions based on current knowledge of the habitat requirements of the macro-moths are fulfilled, at least in part. This is encouraging for there is sometimes not the time or resources for in-depth fieldwork. However, there is room for much further work, particularly on the larvae. We need to know not only which are the preferred foodplants but more about the places and situations in which the host-plant is used. This is particularly important if we are to conserve the rarer species and to recognise when habitats are deteriorating.

Acknowledgement

I would like to acknowledge the support of Oxford Polytechnic during the course of the fieldwork.

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SWARMING OBSERVED IN *AGATHOMYIA FALLENI* (ZETT.) (DIPT.: PLATYPEZIDAE) AND ITS OCCURRENCE IN LONDON

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ON the afternoon of the 21st of September 1987, I visited the Horniman Nature Trail, Forest Hill, London (TQ 347734) to collect Diptera. At a point about midway along this linear piece of land I observed a number of fairly large insects swarming near the top of a young silver birch (*Betula pendula*) at a height of about 5-7 metres. Eventually a specimen was secured and was identified as a male of the common *Sargus bipunctatus* (Scop.) (Dipt., Stratiomydae). Swarming in stratiomyids is a frequently observed phenomenon and whilst interesting I considered it not of great importance. During the observation and eventual capture of the specimen, however, my attention was drawn to a swarm of much smaller Diptera below the *Sargus* at a height of about 3-4 metres. Part of this swarm was swept and a total of eleven male specimens taken of an *Agathomyia* species (Dipt., Platpezidae) unfamiliar to me at the time. Using Chandler (1973) these proved to be *Agathomyia falleni* (Zett.), a species hitherto only recorded from Surrey and Kent in Britain and one which was previously not known to swarm.

The flies formed a loose swarm about twenty in number. Individuals remained stationary for a few seconds prior to darting quickly within the swarm before resuming hovering again. Often the darting would be directed at another male which would change position to some other part of the swarm. The flies appeared to form small groups of five or so individuals which all faced the same direction (the separate groups facing different directions). The direction within a group was altered by an individual approximately every five to ten seconds and was followed abruptly by other members of that group. Movement within the swarm was horizontal (except when disturbed by my netting). Mr Peter Chandler informs me that as far as he is aware swarming has not been observed in this species before.

The swarm was centred in a narrow clearing on the Trail about three metres in diameter, slightly to one side of the footpath on this site. Apart from silver birch, trees surrounding the clearing comprise single mature sycamore (*Acer pseudoplatanus*), hybrid oak (*Quercus* x), crack willow (*Salix fragilis*) and a pollarded common lime (*Tilia* x *europaea*). The swarm was equidistant from all the trees and I found no particular association with any species. The canopy of the trees at the top of the clearing overhang to an extent that the circumference of the clearing here is appreciably less than lower down. The shrub layer over which the flies were swarming comprises bramble (*Rubus* sp.) and stinging nettle (*Urtica dioica*). The weather was bright and sunny with no perceptible wind. By

general sweeping nearby I was able to procure an additional male and female of *A. falleni* as well as two males and four females of probably the most frequent *Agathomyia* species in Britain, *A. unicolor*.

A return was made to the site on the afternoon of the following day (22.ix.1987). The weather was overcast and there was slight rain although the swarm of *A. falleni* was still present and appeared unaffected by the downturn in the weather. Indeed, the swarm seemed to have increased slightly in numbers to between twenty and twenty-five individuals. A brief inspection of part of the swarm revealed it to comprise entirely of males again. A swarm of *Sargus bipunctatus* was not present however on this occasion. Sweeping nearby yielded two female *A. unicolor*.

On the 25.ix.1987 I visited the Nature Trail again, to find a swarm still present in similar numbers to the last occasion. A period was spent observing the swarm to try to determine whether females were flying into the swarm for mating. This behaviour has been observed in other swarming platypezids including other *Agathomyia* species (Kessel 1962, Chandler 1968). A period of about forty-five minutes was spent in which time I failed to see any females nearby. A search for other swarms in nearby clearings — all of which are larger and open on some part of their perimeter — was also unsuccessful. Sweeping, however, of the scrub vegetation again revealed one female *A. unicolor* as well as a female *Sargus bipunctatus*. Swarms of male *Sargus bipunctatus* and a *Fannia* sp. (Fanniidae) were also present above the *A. falleni* swarm (the *Fannia* immediately above at about four metres height, the *Sargus* at about seven metres). A single female of *A. falleni* was finally taken in a water trap on 6.x.1987 at the eastern end of the Trail near the entrance (TQ 346731). A search for platypezids on 27.x.1987 failed to reveal any individuals. The only swarming Diptera on this occasion were male *Limonia (Dicranomyia) chorea* (Tipulidae).

The foodplant of *A. falleni* is the common bracket fungus *Bjerkandera adusta* (Chandler 1973). A search for fungi on the Nature Trail failed to reveal any *B. adusta* and little else. *B. adusta* has been recorded from nearby Sydenham Hill Wood (TQ 344726) and Dulwich Wood (TQ 340724) however, both about one kilometre south west of the Nature Trail. In addition I have recorded a number of platypezids including *Agathomyia antennata* and *A. unicolor* from Sydenham Hill Wood. (The foodplant of *A. antennata* is probably *Trametes versicolor* whilst the foodplant of *A. unicolor* is also *Bjerkandera adusta*). The prospect of *A. falleni* travelling a distance of one kilometre to swarm and mate seems to me to be very unlikely, bearing in mind their slow flight and also previous platypezid records show that they are generally found not far from their foodplant. No search for fungi was made in the neighbouring private gardens or in the Horniman Gardens both of which abut onto the Nature Trail so that there is a good possiblility of *B. adusta* occurring in the immediate area outside the Trail.

The Horniman Nature Trail itself has been created from a raised embankment running approximately north north-east to south south-west that once supported part of the line of the former Peckham to Crystal Palace railway and is situated to the north west of the Horniman Gardens, Forest Hill. The site is wooded with a large number of tree species present — a reflection of the varied history of the site and pattern of human disturbance. Sycamore is the dominant species (representing 35% of total numbers of trees), with ash (11%), goat willow (10%), oak (both native species) (10%) and silver birch (9%) present in fair numbers (Day 1986). There is very little dead wood on the site. An association of *A. falleni* with sycamore has been noted previously (Chandler 1968, 1973). This would appear to be due to the fact that the large leaves of this tree afford a good surface from which the species can congregate for mating. This would also explain the similar association with Spanish chestnut, horse chestnut and possibly hazel (Chandler 1973 p.15, Parmenter 1953 p.122). (A similar association with large-leaved tree species has been found in other platypezids.) Although I was not able to find *A. falleni* on the leaves of the sycamore near the swarm its presence nearby may be significant. (Kessel also failed to find specimens of *Agathomyia cushmani* on leaves of trees whilst males were swarming yet they were found on leaves at other times.) It may also be important to mention that other plant species from which platypezids have been taken were present nearby including oak, birch and bramble (*Rubus* sp). Pont (1987 p.312) in discussing the swarming of sepsid flies (these swarms are possibly for hibernation rather than mating), notes their attraction to *Rubus* sp., and in a letter to Mr Pont, Dr Newton, a specialist on *Rubus* explains that the bramble bushes and leaves may provide a suitable "physical platform" for the swarming flies which may also be the case with the *A. falleni* here. It is of special interest that Lundbeck (1927) found both *Acer* and *Rubus* to be paticularly attractive to various platypezids including *A. falleni*.

Published records of *A. falleni* in Britain are few. The species was first recorded as British by L. Parmenter (1953) who took a single male from a hazel leaf in oakwoods at Box Hill, Surrey on 21.ix.1952. Chandler (1968) records a second specimen found in Parmenter's collection and taken on 7.x.1956 from Mickleham, Surrey, a locality not far from the first. Mr Chandler has since collected this species himself from Knole Park, Sevenoaks and also Pond Wood, Chislehurst, where he has bred the species from *B. adusta*, both in Kent on various dates from 9.x.1966 to 30.ix.1967 (Chandler *loc cit*). There are unpublished records of *A. falleni* from Harry Wood, Sussex, 8.x.1976 (I.F.G. McLean); Wisley Common, Surrey, 11.ix.1971 (A.E. Stubbs); Gracious Pond, Chobham Common, Surrey, 31.x.1976 (P.J. Chandler); Scadbury Park Nature Reserve, Chislehurst, Kent 27.x.1983 and 3.xi.1984 (P.J. Chandler). The Scadbury records were a male and female respectively on sycamore foliage (Chandler pers. comm.).

The aggregation of wholly male *A. falleni* recorded here would seem to compare closely with the known mating activities of platypezids. The swarming of males is purely for the purpose of mating. Females are dispersed throughout the neighbouring area and are attracted to the all male congregation. The only other published observation I could trace in recent years on swarming in this group of flies is by McLean (1977). Dr McLean records a swarm of nine males and one female *Opetia nigra*. (It is important to add that *Opetia* is morphologically different from other platypezids and it is now generally included in the family Opetidae.) The single female in this case has presumably just entered the swarm for copulation at the point when the flies were taken.

It is also interesting to note the absence of the *Sargus bipunctatus* swarm during the second visit to the site when there was slight rain. This absence would seem to suggest that compared with *Agathomyia falleni*, *Sargus bipunctatus* is less tolerant of weather conditions and requires sun for mating. The flight period of *S. bipunctatus* is appreciably longer than the platypezid suggesting that because the time constraints are less severe the need to swarm and mate is consequently less urgent within a given period in this species.

A large number of questions remain to be answered about *A. falleni*. The rarity of this species is certainly puzzling in view of the frequency of its foodplant. It may be that there is some competition with the more frequent *A. unicolor* which shares the same foodplant. It would be interesting to know whether both species occur together as larvae and feed on the fungi at the same stage of its growth. The fact that *A. falleni* has never been observed swarming before is also difficult to understand. Certainly it appears undemanding in its choice of swarming site choosing some of our most frequent plant species. Hopefully the observations recorded here will encourage others to look out for these interesting flies and fill in some of the gaps in our knowledge of this group.

Acknowledgements

My thanks to Peter Chandler for many useful comments and for permission to cite his unpublished records. My thanks also to Dr Ian McLean for checking the article and to Dr McLean and Alan Stubbs for permission to use their records. I would also like to thank Dr Gordon Reid for use of facilities at the Horniman Museum, Forest Hill.

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Wild cabbage, *Brassica oleracea* L., a new host for two species of wood-boring Coleoptera.

Following my discovery in June 1987 of the New Zealand littoral weevil *Macrorhyncolus littoralis* (Broun) below Shakespeare Cliff, Aycliff, near Dover, Kent (*Entomologist's Mon. Mag.*, in press), Eric Philp and I visited the site (TR 302394) on 26 May 1988. Apart from hoping to find further specimens, our main aim was to try to determine whether the weevil was established at the site, and if so where, and in what, it might be breeding. Driftwood is scarce on this exposed coast, there are no groynes or wooden sea defences nearby, and the only dead wood was on some old stunted privet (*Ligustrum vulgare* L.). In desperation I turned my attention to some old woody stems of the wild cabbage (*Brassica oleracea* L.) which grows commonly on disturbed soils along this coast. One piece contained some small exit holes and, when split open, revealed frass-filled larval borings. Our attention was then turned to the dead sections of standing plants and, within a few minutes, five adult weevils were collected from the pithy interior of the stems of two such plants. These were too large to be the New Zealand species and later scrutiny showed them to be *Caulotrupodes aeneopiceus* (Boh.). Four specimens of this weevil had been collected in pitfall traps at this site between 27 May and 24 June 1987 during a survey carried out for Eurotunnel. Dissection of many more cabbage stems both at this site, and at the cliff-base near the Old Colliery Platform to the west, failed to produce any more specimens. The only other insects found within the stems were a few common earwigs, *Forficula auricularia* L., and a nest of the small ant *Leptothorax tuberum* F.

Although the Continental and older British literature describes *C. aeneopiceus* from wooden wine casks, over the past 30 years British records for this species have been predominently from coastal localities. More typically it seems to occur in strandline driftwood or in logs and dead trees on, or close to, the top of the beach. Its distribution extends from Suffolk, along the south and west coasts of England and Wales as far north as Ayrshire (Strathclyde). I have a specimen taken with *Mesites tardii* (Curt.) in an ash log on the beach adjacent to Ravenshall Wood, Kirkcudbright (NX 517527). Of perhaps greater significance are the eight specimens I

collected on Lundy, North Devon (SS 140441) in dead sycamore and elder. Stems of the latter shrub closely resemble those of the wild cabbage in possessing a pithy core. Eric Philp informs me that, although *C. aeneopiceus* is known from the South Kent coast, he has no records since 1907.

Several short sections of dead cabbage stem were brought back to the laboratory, including the piece containing emergence holes. By early October 1988 a single male *Anobium punctatum* (Deg.) was found dead in the container. Dissection of the stems produced three larvae of this species, all from the same piece of stem. This, the "common furniture beetle", is known to breed in the timber of a large number of trees and shrubs, but this discovery in a member of the Cruciferae may be the first record of it breeding in an herbaceous plant. — R. COLIN WELCH, Institute of Terrestrial Ecology, Monks Wood Experimental Station, Abbots Ripton, Huntingdon, Cambs PE17 2LS.

A probable second brood of *Euchoeca nebulata* Scop. (Lep.: Geometridae), the Dingy Shell, in East Anglia in 1988.

The Dingy Shell moth *Euchoeca nebulata* (Scop.) is reportedly univoltine in Britain. Skinner (*Moths of the British Isles,* Viking, 1984), states that the single brood flies from June to early July with larvae on alder (*Alnus*) in July and August. For the continent of Europe, however, it appears that the insect is bivoltine; Culot (*Noctuelles et Géomètres d'Europe*, volume 3, page 249 [reprinted 1986 by Apollo Books, Denmark]) states, under *Larentia obliterata* Hufnagel, "In Switzerland and France, there are generally two generations, with the moth in May/June and the caterpillar in June, then August - September, on Alder."

It is evidently of interest therefore to record the following two separate captures of this insect: the first, a male, was taken by myself in a light trap adjacent to the Sizewell B nuclear power station site on the Suffolk coast on the night of 26/27 August 1988; the second, also a male, was taken in the garden light trap of Charles Watson at Bishop's Stortford, Hertfordshire, on the night of 10/11 September 1988. Both insects were rather worn. The Sizewell trap was set in an area of alder trees and the presence of the moth a few weeks earlier would have been expected. At Bishops Stortford, however, the nearest alder is probably that along the River Stort some distance away and the record here is a first for Mr Watson's garden after many years of trapping.

It is interesting too to note that the single British brood flies, apparently, between the two continental broods. If the presence of July/August examples in Britain in 1988 indicates a second brood here, then one may perhaps expect the first brood to have appeared slightly earlier than normal — perhaps coinciding with the continental flight period. Does anybody's experience of the species in 1988 bear this out? COLIN W. PLANT, Passmore Edwards Museum, Romford Road, Stratford, London E15 4LZ.

DICHOMERIS USTALELLA FAB. (LEP.: GELECHIIDAE), REDISCOVERED IN BRITAIN

A.N.B. Simpson

The Sycamores, Old Rectory Gardens, Leigh, Worcestershire.

ON 6.vi.1987 I visited Shrawley Wood, mid Worcestershire in the company of two dipterists, Nigel Jones and David Denman, to look for *Chalcosyrphus eunotus* (Dipt.: Syrphidae), a fly I had first found there in 1986. Whilst DD was sweeping low vegetation near a pond, he captured a moth, which I later realised was a male *Dichomeris ustalella.* This insect has only been recorded in this country from Worcestershire by Horton and Edmunds (recorded as *Ypsolophus ustalellus* Fab. in *Ent. mon. Mag.* 1867. **4**: 152). Apparently Edmunds took one in 1861, but was unable to identify it, and Horton was said to have taken two on May 29th 1864. They were finally identified by Stainton in 1867.

Horton describes the capture as being made about eight miles from Worcester, sunning itself on lime leaves. He also describes taking one ". . . close at hand . . ." in 1865, but does not specify the exact locality. Stainton describes and illustrates the insect, giving *Carpinus, Betula* and *Salix* as foodplants. I suspect this information applies to Continental material, as I have found no account of this species being reared in this country.

On 2nd September 1987 I visited the locality in the company of Dr M.W. Harper in an attempt to find the larva. The locality is a somewhat unusual woodland composed almost entirely of small-leaved lime (*Tilia cordata*) coppice. There are occasional oak or sweet chestnut standards, and a small number of hazel, alder and sallow along the line of pools artificially created along a small stream which runs through the wood. After unsuccessfully searching for the larva, we took to beating the lime coppice. In time, MWH beat an interesting larva and, suitably encouraged, we continued and finally took eleven.

Description of larva:

> *Head:* dark brown; thoracic plate anteriorly brown with two black plates occupying the rear three-quarters; segments three and four black in posterior two-thirds with pale blue-grey anterior third to each segment. *Abdomen:* rather translucent greyish green; pinnaculae large, black and conspicuous with pale whitish hairs; anal plate marked with black; rear claspers black with pale chestnut tips; prothoracic legs black. Abdomen noticeably thin in relation to larger head and thorax, especially in early instars.

The larva feeds in a flimsy spinning — two leaves are joined with a few strands of silk and the larva eats holes through the leaves, in between the veins. The larva hibernates in a folded leaf and in captivity will spin up in a fold of tissue paper.

Three hibernating larvae brought indoors in February pupated *in situ* after about 14 days. One parasite was reared and two female *ustalella*

emerged 15 and 18 days after pupation. Two larvae left outdoors both succumbed to fungal attack.

The imago is very striking. The wingspan of males being 15.5mm, and of females 17.6mm. There is an ill-defined golden, costal blotch. Palps are typical of *Dichomeris*, with a marked tuft on the second labial segment. They seemed rather sluggish in their habits, and thus could easily be overlooked in the wild.

Acknowledgements

My thanks are due to E.C. Pelham-Clinton for drawing my attention to the record in the *EMM*; Dr K. Sattler for confirming the identity of the first specimen at the BENHS Exhibition; David Denman for taking the first specimen and Mr C. Powick, the owner of the wood, for permission to visit and collect insects.

A large number of Orange-tip (*Anthocharis cardamines* L.), (Lep.: Pieridae) eggs on a single plant.

On 31.v.1988 at Needham, Norfolk (TM 2281) I found eight eggs of this species on one garlic mustard plant (*Allaria petiolata*). It is unusual to find more than one egg per plant, although occasionally two or three are recorded. — ADRIAN M. RILEY, Entomology and Nematology Department, Rothamsted Experimental Station, Harpenden, Herts AL5 2JQ.

***Cheilosia variabilis* Panz. (Dipt.: Syrphidae) and figwort.**

The association of this *Cheilosia* with *Scrophularia nodosa* L., the common figwort, is doubtless well enough known, but it is probably seldom that one has such a clear and striking demonstration of it as I now relate. The plant was very nearly, and the hoverfly totally, unknown to me from this district until this year, 1988, when in late May I came across a large and strong, many-stemmed clump of the figwort by a path in the woods at Shooters Hill near here. Upon it was a flourishing colony of the weevil *Cionus scrophulariae* L., almost the first examples of the genus to have occurred to me anywhere in this area; but what was more remarkable, a *Cheilosia variabilis* at once appeared and fed intently from one of the figwort flowers, followed equally promptly by another. Two more were seen basking on foliage a little way off. About a week later, when I next passed the spot, the *Cheilosia* was again in evidence. (All these flies were males.) Well away from the site *C. variabilis* was not to be seen, and it is hard to resist the conclusion that the fly is breeding in the roots of this *S. nodosa*, despite its robust and healthy appearance. Farther out of London, where both plant and insect are common in many districts, the special connection between them must as a rule be less apparent. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

BREEDING *GNORIMUS NOBILIS* LINN. (COL.: SCARABIDAE) IN CAPTIVITY

J.A. OWEN

8 Kingsdown Road, Epsom, Surrey KT17 3PU.

ON 5.vii.86, my friend Mr D. Appleton took me to a site in the New Forest where we found a pair of *Gnorimus nobilis* on a flower head of *Heracleum sphondylium*. I took them home and put the female into a large (10 litre) glass jar in which I had loosely packed some soft rotten wood from an old plum tree to a depth of about 8 cm. I set the jar in a north-facing window which allowed morning and evening sunshine onto the jar and, every two days or so, put fresh flower heads of *H. sphondylium* into the jar. These were obviously attractive to the beetle which wandered over the flowerhead feeding by "licking" the florets. Flower spikes of cherry laurel (*Prunus lusitanica*) were similarly treated as were over-ripe strawberries, blackcurrant jam and honey! The beetle was kept in the jar for the next few weeks. Her appetite remained good. At night, and often also during the day, she was not to be seen, having burrowed into the rotten wood. She was removed from the container on 10.viii.86.

At the end of September 1986, the rotten wood in the jar was found to contain about 20 small chafer larvae ranging in length from about five to 10 mm. Exactly where the eggs had been placed by the female was, of course, not determinable but it seems likely that oviposition took place when the female submerged herself in the rotten wood.

The larvae were left in the jar for a further six months by which time they were about 15 mm long. They were then transferred to three plastic buckets in which sections of the trunk of a long dead ornamental cherry tree about 15 cm in diameter had been placed, packed around with some of the dead plum wood. The buckets were fitted with perforated lids. Most of the cherry wood was sufficiently hard not to admit easily the point of a knife but there were one or two soft areas in which small holes were dug and the larvae introduced. Two buckets were then left in a semi-detached, unheated garage undisturbed apart from occasional addition of small amounts of water to keep the wood damp. The third containing five larvae was given to a friend who stored it similarly.

On returning from three weeks holiday on 20.6.88, I was delighted to find two adult *Gnorimus* sitting on the surface of the wood in one of the containers. Two days later, another four adults appeared, followed by a further three during the next three days. The friend to whom I had given the third bucket reported that all five larvae produced adults about the same time. All the adults were of normal size and all were perfect specimens. Pairs, confined as the original female had been, mated readily and the females laid eggs which later produced another generation of larvae.

During the last year of their growth, the larvae remained inside the pieces of old cherry wood and were thus not available for inspection without the wood being split open which was thought in general to constitute an unwarranted, and possibly dangerous, disturbance. In February 1988, however, curiosity overcame caution and a piece of the wood in one container was broken open. This revealed larvae in cavities within. Three which were removed, were seen to have emply guts and looked as if they were in a pre-pupal state though they may simply have not been eating during the winter. They were rehoused in loose rotten wood in another container and given to another friend who later reported that they produced three perfect adults about the same time as the others. Some two weeks after the last adult had appeared, the wood of the two buckets was inspected and this revealed that only one larva had not matured. Its gut content, visible from the outside, indicated that it was still feeding.

Adults of *G. nobilis* have been reared from larvae found in the wild (usually in old apple or plum trees) by various entomologists (e.g. Champion, 1908; Massee, 1929; Allen, 1948) but I can find no previous record of the species previously having been taken through its complete life cycle in captivity. In this instance, the whole process took (for most of the individuals) just under two years. Though larvae of the species have often been found in the wild in loose wood mould, my findings suggest that, in their later stages at least, they feed on relative hard wood as might be inferred from their stout mandibles. Champion (*loc. cit.*) reported similarly that his larvae in captivity fed on the "underside of pieces of damp apple bark" rather than on wood mould.

Acknowledgements

I am most grateful to my friend Mr D. Appleton for taking me to the area where the original pair of beetles was found and I thank the Recreation and Range Manager, Forestry Commission, Hampshire for permission to study insects in the New Forest.

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SOME INTERESTING LEPIDOPTERA AT THE ROTHAMSTED INSECT SURVEY LIGHT TRAP AT RHANDIRMWYN, CARMARTHENSHIRE

DAVID DAVIES[1] AND ROBERT M. PALMER[2]

[1] *Ty'r Ysgol, Rhandirmwyn, Llandovery, Dyfed*
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THE following records are of Lepidoptera taken at the Rothamsted Insect Survey light trap in the village of Rhandirmwyn some seven miles north of Llandovery, Dyfed (Rothamsted Site No. 346; Vice County 44; O.S. Grid ref SN 782 441). The trap is set 550 feet above sea level on a steep south-facing slope in an area where the average rainfall is 60 inches/year. The underlying rocks are of acid Silurian and Ordovician shales and grits and the surrounding hills, which in places have high-altitude sessile oak woods on their slopes, rise to 1700 feet. There are extensive forestry plantations in the area comprised mainly of sitka spruce and Japanese larch. The fields are small and enclosed by hedges: sheep farming is the prevailing land use.

Many of the plant communities are of exceptional interest and include unimproved herb-rich meadow; river banks are fringed with alder, ash and wych elm; oak woods on the steep valley side and upland grassland, moor and blanket bog on the unenclosed summits. Among the noteworthy plants are rock stonecrop — *Sedum forsteranum*, a very local plant of Wales and south-west England and parsley fern — *Cryptogramma crispa*, an arctic alpine fern of screes on acid soils, which, although abundant in many places in Snowdonia is a rare or local fern elsewhere in Wales. The lesser clubmoss — *Seliganella selaginoides* and globe flower — *Trollius europaeus* are found here at or near their southernmost limit in Britain. Some of the deep river gorges with low light intensity and high humidity support a rich assemblage of ferns, e.g. oak-fern — *Gymnocarpium dryopteris* and Wilson's filmy fern — *Hymenophyllum wilsonii*; mosses including *Ctenidium molluscum*; and liverworts including *Reboulia hemisphaerica*; the rare oceanic hepatic *Jubila hutchinsinae,* and *Nowellia curvifolia* on decayed oak trunks. This diversity of habitat is reflected in the Lepidoptera, species with a predominantly northerly distribution are both well represented in the list that follows, which contains a few of the more interesting of over 500 species of Lepidoptera recorded since 1981. The authors thank E.C. Pelham-Clinton who has confirmed the identity of some of the micro-lepidoptera.

GRACILLARIIDAE

Caloptilia robustella Jackh. A rare or under-recorded species in the west of its range (Emmet *et. al.,* 1985). A single specimen taken in June, 1987 is apparently the first record from S. Wales.

COLEOPHORIDAE.
Coleophora deauratella L. & Z. vii/86 (one).

OECOPHORIDAE.
Pseudatemelia josephinae Toll. Appears to be a scarce insect recorded from a few widely scattered sites in England and Scotland (Birkett, 1987). At Rhandirmwyn the moth appears to be well established, a few have been recorded in July each year since 1982.

GELECHIIDAE.
Psoricoptera gibbosella Zell. 3/ix/85 (one).

TORTRICIDAE.
Pandemis cinnamomeana Treits. Recorded regularly and quite common.
Spatalistis bifasciana Hb. A single specimen of this scarce species (Bradley *et. al.*, 1973) was taken in July, 1987.
Lobesia abscisana Doubl. A single specimen of this species, which appears to have a predominantly eastern distribution (Bradley *et. al.*, 1979) was taken in July, 1986.
Epinotia signatana Dougl. vii/86 (three); vii/87 (one).
E. maculana F. x/86 (two); x/87 (one).

PYRALIDAE.
Phycitodes binaevella Hb. viii/86 (three).
Ephestia parasitella Stdgr. vii/87 (one).

GEOMETRIDAE.
Eupithecia abietaria Goeze A single specimen 1/viii/86.
E. valerianata Hb. vi/84 (one).
E. venosata F. vi/83 (one); vi/84 (two); vii/86 (two).
E. fraxinata Crewe vii/83 (one); v/87 (two).
E. virgaureata Dbl. A few each year since 1984.
Pterapherapteryx sexalata Retz. Two in 1983 (21/vi, 27/vii).
Apocheima hispidaria D. & S. Usually a rather common species; 31 were taken in 1982.
Deileptenia ribeata Cl. A few specimens have been taken most years, with the exception of 1984 and 1985.
Alcis jubata Thunb. Single specimens — 22/vii/81, 27/vii/83.
Cleorodes lichenaria Hf. 10/vi/86 (one).

ARCTIIDAE.
Atolmis rubricollis L. 1/vi/81 (one); 18/vi/83 (three).
Lithosia quadra L. 30/vii/84 (one).

NOCTUIDAE.

Standfussiana lucernea L. Single specimens of this predominantly coastal species were caught on 13/viii/82, 11/vii/86 and 15/vii/87.

Papestra biren Goeze.F. Occurs in small numbers most years.

Orthosia populeti F. A single specimen, 11/iv/82.

Lithomoia solidaginis Hb. A single specimen 10/viii/82 — well to the south of the normal range of this species in Wales (Bretherton *et. al.,* 1983).

Acronicta menyanthidis Esp. 14/vii/86 (one).

Ipimorpha retusa L. This scarce species was taken during late July and August in 1981-1983, five, two and three specimens respectively, but has been absent subsequently.

Apamea furva Cockayne 12/viii/85 (one).

Heliothis peltigera D. & S. A single specimen on 8/x/85. The only representative of scarcer migratory species at Rhandirmwyn.

Lithacodia pygarga Hufn. 17/vii/87 (one).

Nycteola revayana Scop. Occurs most years, usually singly.

Syngrapha interrogationis L. VII/81 (two); vii/82 (two); vii/84 (one); 1986 (two).

Laspeyria flexula D. & S. 12/vii/83 (one).

Hypena crassalis F. Singly in vii/81; vii/83; vii/84; viii/86 and vi/87.

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In the right place at the right time — Dorset 16th-23rd October, 1988.

For the first time in my lepidoptera excursions I, together with my friend Clive Harding, had a remarkable few days' family holiday near Swanage. Several nights we ran our lights at Durlston Head seeking out sheltered spots from the cool winds.

Little of interest visited our m.v. lamps the first couple of nights, but the third and fourth evenings, notably the Tuesday and Wednesday, produced a fantastic change, for together with the usual resident species our first *Heliothis armigera* (Hb.) arrived, together with a single *Mythimna vitellina* (Hb.) During the next three nights no less than sixteen *H. armigera*, four *M. vitellina*, eight *Spodoptera exigua* (Hb.), five *Palpita unionalis* (Hb.) and, most exciting of all, a new Pyralid to me, a single specimen of *Hymenia recurvalis* (Fab.), quite a rare visitor to the British Isles, came to our lights.

The next couple of nights produced little apart from *Agrotis ipsilon* (Hufn.) *Autographa gamma* (Linn.) and dozens of *Nomophila noctuella* (D. & S.). Two *Mythimna unipuncta* (Haw.), a few *Orthonama obstipata* (Fab.) and a single *Rhodometra sacraria* (Linn.) came in late.

However, the last night of our holiday produced more excitement further along the coast with two more *H. armigera*, one male *Agrius convolvuli* (Linn.) and a moth we had often joked about during this spell of migrant activity, but never really expected to see, an almost perfect male *Trigonophora flammea* (Esp.) sitting in the grass, covered in dew, about five feet away from the trap.

What a way to end our short holiday! We were very reluctant to leave as the weather seemed to be improving again, but we both had commitments at home. However we will certainly remember this autumn holiday for a very long time and wonder during the winter months what might have turned up had we been able to spare a couple more nights in the area.— D.G. Down, 16 Woodend Close, Thundersley, Benfleet, Essex.

Special migrants in late October 1988.

Unusually high minimum temperatures and warm air currents direct from the Mediterranean and North Africa resulted in a most exciting list of immigrant species at Studland, on the Dorset coast. Southerly winds continued uninterrupted from 15th October until 27th October and the immigration seems to have reached a peak on the 22nd. The numbers of *Nomophila noctuella* were remarkable. The following moths were recorded:

15th October: 1 *Mythimna vitellina* Hübn., 2 *Peridroma saucia* Hübn., 30 *Nomophila noctuella* D. and S.

22nd October: 2 male *Thera cupressata* Geyer (this would appear to be only the second time this species has reached the British mainland), 2 *Heliothis armigera* Hübn., 3 *Spodoptera exigua* Hübn., 1 *Rhodometra sacraria* L., 4 *Orthonama obstipata* Fab., 2 *Palpita unionalis* Hübn., 25 *Udea ferrugalis* Hübn., and over 100 *N. noctuella*.

23rd October: 2 *S. exigua*, 1 *P. saucia*, 1 *R. sacraria*, 4 *O. obstipata*, 1 *Euchromius ocellea* Haw., 15 *U. ferrugalis* and over 40 *N. noctuella*.

24th October: 4 *S. exigua*, 20 *U. ferrugalis* and 50 *N. noctuella*.

25th October: 1 *H. armigera*, , 1 *S. exigua*, 1 *R. sacraria*, 1 *O. obstipata*, 10 *U. ferrugalis* and 20 *N. noctuella*.

26th October: 1 *Cyclophora puppillaria* Hübn., 1 *H. armigera*, 3 *S. exigua*, 3 *R. sacraria*, 1 *O. obstipata*, 12 *U. ferrugalis* and 20 *N. noctuella*.

27th October: 2 *H. armigera*, 1 *S. exigua*, 10 *O. obstipata*, 10 *U. ferrugalis* and 15 *N. noctuella*. — David C.G. Brown, Jacksons Drive, 25 Charlecote, Warwick.

ISCHNURA PUMILIO (CHARPENTIER) (ODONATA: COENAGRIIDAE) — A WANDERING OPPORTUNIST?

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ISCHNURA pumilio is restricted to relatively few sites in south and west Britain and Ireland (Hammond 1983). Askew (1988) states that the species will "rapidly colonise newly-formed biotopes, but colonies tend to die out after a few years". Certainly, one common feature of the habitat of *Ischnura pumilio* in Britain and Ireland seems to be some degree of disturbance or an element of environmental instability. In south and west Britain, it is commonly found in recently-created artificial wetlands such as industrial reservoirs (as china-clay areas of Cornwall or the south Wales coalfield) and gravel pits (as at the Cotswold Water Park in Gloucestershire/Wiltshire), while in Ireland, the species is typically recorded from disused quarries (Cotton 1981, Rippey and Nelson 1988). Many sites for the insect in West Wales are stock ponds where grazing animals puddle substrate and keep emergent vegetation to a minimum (Coker and Fox 1985). The species also occurs in spring and flush habitat on unstable mineral substrates in the New Forest, Forest of Dean and Pembrokeshire (Hammond 1983). In all but the spring and flush sites, an important feature of these situations is the temporary nature of conditions which appear to suit the species. Wetland succession, if undamaged by Man, leads to the colonisation of shallow muddy substrates (which seem to provide the preferred habitat) by dense vegetation which results in its ultimate disappearance. This is certainly the case in the Cotswold Water Park where breeding sites have become overgrown with *Typha* and thick beds of *Glyceria fluitans* and where *I. pumilio* has consequently disappeared. In order to be able to exploit such temporary conditions, the species must be dispersive, and indeed, it is often recorded in areas far from the nearest known colonies. However, *I. pumilio* normally has such weak flight that it seems an unlikely long-distance migrant.

However, three observations suggest that the insect may be able to cover substantial distances. The first concerned *I. pumilio* at a small pool at Merthyr Common, mid Glamorgan on 21 July 1983. The site was a small triangular pool 10 m x 6 m, very puddled about the muddy edges with some tipped rubbish, and with at least two male *I. pumilio* present. The day had been warm and hazy early on, but had become clear, still and very hot from midday. One of the damselflies being watched during the afternoon started to fly strongly and directly away from the water's edge, but when some 3m away from the pool, it flew directly upwards very rapidly. Similar phenomena were witnessed at two sites in the Cotswold Water Park (Gloucestershire) on 19 June 1988. At one site, on the edge of a reinstated gravel pit, an area of open gravel with water-filled tractor ruts had

attracted four male and two female *I. pumilio*. The males spent much time settled on the few emergent *Agrostis stolonifera* stems present but would occasionally patrol around the pool in the typical weak, jerky manner. After one such bout of flight of some 1.5 minutes, the insect suddenly flew up vertically, steeply climbing upwards until completely lost from sight through x8 binoculars. At another site, less than two kilometres away, and comprising very similar habitat about the edges of a gravel pit being in-filled with refuse, another male flying along the length of a 6 m long caterpillar track also suddenly changed from the "normal" jerky flight to a strong rapid upward movement, which I again followed vertically until it was completely lost from sight. The weather on these second occasions was also similar — very high midday temperature and little wind, leading to the development of strong thermal currents and surface up-draughts.

These observations are interesting for two reasons: firstly, it would appear that the weak jerky flight of *I. pumilio* is not its only mode of flight; in fact, the species can exhibit strong direct flight (as per *I. elegans*) on occasions. Indeed, it may be said that the erratic flight pattern may have adaptive significance in signalling to conspecifics its presence at small isolated pockets of suitable habitat, accentuated by its distinctive contrasting coloration (especially the blue tail and pale underside). Such a strategy to attract a mate at widely separated units of suitable habitat would clearly be an advantage to a highly dispersive species. Secondly, it would seem that the insect does possess a means of dispersal, taking advantage of hot still weather to leave suitable habitat (having presumably first attempted to reproduce) and disperse elsewhere, not merely as newly emerged teneral individuals, but also as full adults, by strong upward flight. Such dispersal might be expected to be aided under such conditions by thermals which would facilitate large-scale dispersal of a small damselfly.

I have not seen such strong dispersal amongst sexually mature damselflies, but would be extremely interested to receive any other accounts of this or other species showing such behaviour.

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NOTES ON BREEDING THE PURPLE EMPEROR, *APATURA IRIS* LINN., IN CAPTIVITY

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IN mid-afternoon on July 28th 1984, in Alice Holt Forest, Hampshire, I inadvertently disturbed a female Purple Emperor which had been feeding from the sap oozing from the trunk of an oak tree about five feet above the ground level. A few minutes later the butterfly returned, presumably to resume its feasting, but as I had already spent five days in the forest in a fruitless endeavour to capture a female for breeding purposes, this was an opportunity not to be missed, and this time I was successful.

For 13 of the last 17 years I have bred the Purple Emperor in captivity from the egg stage to the imago, and the incident just related might, except for the precise details and for the sequel, apply to any of those years; there was the same pleasure in walking about the forest and enjoying all that Nature had to offer; the sudden surge of excitement on spotting one's first Purple Emperor of the season, flying loftily around the tree-tops; the occasional confusion, until one's eye had become practised again, with the White Admiral; the rarer moments of good fortune when a Purple Emperor seems to discard its elusive habits and present itself to full view on the ground or fly tantalisingly close or low along the ride; the sense of anticipation of a certain capture when a female, seeming to appear from nowhere, descends to a sallow bush within easy reach of the net on a long pole; followed often by the disappointment of missing the capture by a stroke which was mistimed or the height wrongly judged. Finally, when the element of nervous excitement has been overcome and a calmer approach taken, the moment of success arrives and with it a feeling of satisfaction with one's efforts.

Although these features could be common to all of my annual campaigns, there is another aspect which has given widely varying results, namely, the number of eggs obtained in captivity from the female caught in the wild. After two initial years of breeding solely from eggs collected in the forest, I changed over to my present practice of obtaining the eggs from a captive female. So it was that on July 12th 1970 (an early season), I caught the first one, followed by two more the next day, the latter within five minutes of each other, at 1.15 pm, and 1.20 pm, a feat not since achieved.

One of the females was placed on a low sallow bush growing in a large wooden tub and enclosed by fine-mesh netting supported by a wire framework; the other two were placed in sleeves on well-established sallows in the garden. The result was a combination of success and failure. The female in the tub-grown sallow commenced laying on July 24th, with five eggs between 2 pm and 5.30 pm, and a further eight between 5.30 pm and 6.30 pm; subsequent days produced additions of 15 on the 25th, 31 on the

27th, 16 on the 29th, and 14 on the 30th. By August 2nd the total was 132, of which at least ten were later found to be infertile or otherwise unproductive of larvae. On August 7th the butterfly died, having by then laid 150 eggs; a further seven were found in the body afterwards. By contrast, the two sleeved females died on July 29th without laying. From the 140 fertile eggs obtained, 45 pupae resulted in 1971; these produced 25 male and 15 female adults, a success rate of 28.57%; the remaining five consisted of three crippled males, one crippled female and one "leaking" pupa which failed to achieve the imaginal state. In accordance with my normal practice, the 40 good specimens were released in the area from which the parent female was taken.

This was a reasonably good start to the new regime; unfortunately it was followed in 1971 by a serious failure; a female captured on August 1st laid 57 eggs between the 8th and the 15th (when it died) on the tub-grown sallow, but later all of these were found to have perished. This setback must have had a discouraging effect upon me, for in the next four seasons my activities were confined to occasional visits to the forest for observations only. I now think that the reason for the loss was that spiders, earwigs, slugs, etc. had strongly established themselves in the tub and were grateful for the easy prey.

It was not until 1976 that I resumed breeding of the Purple Emperor. My experience so far then led me to adopt a strict rule for the future, of inducing egg-laying on sleeved sallow branches instead of on tub-grown bushes; the exclusion of predators would thereby be simplified, and to this end I now take great care to wrap layers of bandage tightly round the end of the sleeve which is tied to the branch. At 2.30 pm on July 10th 1976 (an exceptionally early season), I captured a female; I also found two eggs on the same day. I sleeved the butterfly and two days later she laid 12 eggs, then missed a day and resumed on the next, with 15, 13, 29, 16 and 5 eggs being laid on consecutive days, finishing with 36 on July 19th — a total of 126. Most of these were seen to be laid after 2 pm, the latest time observed being 5 pm. The female lived on until July 29th.

From this large batch of eggs, a total of nine males and 14 females resulted in 1977, a success rate of only 18.25%. The first one emerged on July 27th and the last on August 19th, both dates being considerably later than those of an average season. When I saw the first specimen in the sleeve with its wings closed I took it to be a female on account of its great size, but it proved to be an abnormally large male, probably similar to the one named by Heslop ab. *maximus* (*Notes & Views of the Purple Emperor*: 157-158). At the opposite extreme, I once had a dwarf male specimen, but did not record details.

Probably because of the late emergence of my specimens, I did not make my first visit to the forest in 1977 until July 31st, when I released seven males and three females. This delay proved to be a mistake, as I was not

able to capture a female until August 10th, followed by another two days later. Although they remained alive until the 28th and 27th respectively, no laying occurred and one of the females was afterwards found to contain only 30 eggs. As some consolation for this failure I managed to collect seven eggs in the forest on August 7th. In 1978 only one butterfly, a female, resulted from the seven eggs and was released in the forest; but for some unexplained reason I repeated the mistake of the previous year in timing my visits to the forest rather late in the Purple Emperor's egg-laying period, with the consequence that I did not capture a female until August 13th. She laid only two eggs and died on the 25th.

Only one of the larvae from the 1978 eggs survived the winter into 1979, and although it began to move about from the middle of April onwards, it would not feed and died during the first week in May. Even that was not the end of my misfortunes; in the forest on July 27th, the sight of a female Purple Emperor flying low over the grass verges of a ride, more or less in circles and then settling on the grass, seemed promising enough, albeit its behaviour appeared uncharacteristic of the species. While it was settled I tried to catch it — unsuccessfully, because the 8 ft pole to which my net was attached was too unwieldy for me to swing horizontally. At the second time of missing it, the butterfly flew up into the trees and settled just out of reach, as so often happens. Reluctantly accepting failure, I continued walking along the ride, but shortly afterwards it occurred to me that the butterfly might have been seeking moisture from the grass and I therefore returned to the spot with the intention of pouring some water over the ground. In the event this was unnecessary, for when I arrived back the female was settled on the hard ground in the middle of the ride; as it flew up I caught it with a sweep of the net (minus pole this time). After sleeving her I discovered the probable explanation of the unusual behaviour: a loosely "hinged" forewing. This defect also seemed to affect its behaviour in the sleeve, for it fluttered its wings much more frequently than I had ever encountered with other females; its egg-laying capability may also have been adversely affected, since it managed only nine by August 8th and then ceased, though living on until the 18th. All of the eggs hatched, but the year ended disastrously with the sleeve being torn to shreds by strong winds and all the larvae being lost.

Three bad years in succession led me to a re-appraisal of my methods; as a result, I decided upon two more modifications to my usual procedures. Firstly, in order to obtain a large number of eggs, my visits to the forest would have to be timed to enable me to determine by observation the time when egg-laying was just beginning; that would be the appropriate time for the capture of the female which, of course, must be free from defects inimical to the egg-laying process. Secondly, in order to minimise the risk of losses of livestock due to such accidents as torn sleeves, the number of pre-hibernation larvae in a sleeve should be kept as low as possible, five or six being considered as a practical maximum to be achieved in due course.

The next season showed a marked inprovement over the previous three years. It was also notable for the fact that I saw my first Purple Emperor aberration, a male *sorbioduni* Heslop (*Notes & Views of the Purple Emperor*: 169, 222 pl. XVIIa). It was on July 23rd, 1980, at 2.35 pm, when, in company with a youthful enthusiast who had never before seen a Purple Emperor, we saw two of the species appear suddenly overhead; one of them flew off behind the trees and out of sight, but the other settled about 18 feet above the ground on a Cupressus tree. Recognising the advantages of greater height and considerably more youth possessed by my companion, I gave him the chance of capturing the first specimen he had ever seen, and he managed it very competently. He went into raptures on discovering that he had netted a male aberration — a real instance of beginner's luck. A remark I had made to this delighted enthusiast, concerning the after-effect of thunderstorms in sometimes producing an increase in Purple Emperor activity, resulted in his making a quick visit to the forest in the late afternoon of July 26th, when the weather had just cleared following a series of storms earlier in the day; at 4 pm he caught a female at about head height on a sallow bush and gave it to me for breeding.

This female, after taking two days to settle down in the sleeve, put on a remarkable display of egg-laying. Starting just after 1.30 pm on July 28th, she laid 14 by 3 pm, 21 by 3.12 pm, 58 by 6 pm and 68 by 6.45 pm, an average rate of one egg every 4½ minutes for 5¼ hours. On the next day she laid another 32 and then ceased completely, although remaining alive until August 16th. An interesting point is that only 12 of the eggs were laid on the sallow leaves, the remaining 88 being deposited on the netting. The laying of eggs on the netting instead of on the leaves is, in my experience at least, a normal occurrence in captivity, but in this instance the proportion concerned was exceptionally high — the female must have been in a great hurry.

The outcome of my subsequent management of this large quantity of eggs was that I had nine males and 13 females for release in the forest in 1981. This represented a success rate of 22%, but as I had not yet achieved the aim of five or six larvae per sleeve, a result much better than this was not to be expected. When I was releasing some of the adults near the car-park area in the forest, a female demonstrated the Purple Emperor's well-known attraction to shining metal by alighting on the roof of an incoming car; when the car had stopped I watched the driver go to the boot and bring out his picnic equipment, and wondered what his reaction would be on seeing a Purple Emperor on the roof of his car; but he glanced at it as casually as if it had been a Large White! The female flew off in what I could only imagine to be utter disgust.

The 1981 season was marked by my failure to catch a female, and as I did not find any eggs I had no specimens for release in 1982. Furthermore, just as the 1982 season was about to commence I sustained an injury which

caused me to spend the next four weeks lying on my back on the floor. Yet it was during that spell of enforced inactivity that a most remarkable event occurred. On July 4th a friend of my wife's brought what she had earlier described on the telephone as a large butterfly flying about in her kitchen, and which she thought was a White Admiral. I could hardly believe my eyes when I saw that it was in fact a female Purple Emperor. This specimen, after sleeving on sallow, laid only two eggs and died on July 29th. Both eggs hatched, but early in April 1983 I found a large hole in the sleeve and only one larva inside; it went on to produce a female on July 14th. On the next day I was able to capture a female in the forest, at 3.30 pm, and yet another on July 28th, at 4 pm. By the 29th, the first one had laid 12 eggs and then died on August 1st. I did not record the details for the second one, but the combined efforts of the two females resulted in no more than 18 larvae by September 25th, which, in turn, produced four males and two females in 1984, an increase, at least, in the success rate to 33⅓%, albeit with a considerably smaller starting quantity.

Taking an overall look at the results of my breeding activities led me to reflect on the fact that they had settled into a pattern of one exceptionally good year followed by three indifferent or bad years. On this basis, 1985 should be another good year, but I felt that there must be an explanation other than that of chance, for these fluctuations, possibly connected with an unwitted variation in my procedure. The first thing that occurred to me in this respect was the orientation of the sleeve on the sallow bush. There had been some changes of practice — the very first attempt at breeding from a captive female was, as mentioned earlier, with a tub-grown sallow, which would certainly have been placed in the open; and that combination of circumstances had produced 140 fertile eggs. The second attempt, a year later, was initially quite successful, with 57 eggs, but was marred by the subsequent total loss, and the method was abandoned. The next venture, in 1976, was an eminently satisfactory one, with 126 eggs, but in that case the sleeve method was used. It was not until 1980 that the next success with sleeving was achieved, this time with 100 eggs. The problem was to ascertain what changes had occurred between those years. The answer, or rather, what I hope is the answer, came to me suddenly after reading the relevant parts of *Notes & Views of the Purple Emperor,* by Heslop, Hyde and Stockley.

I should say of this work that although I enjoyed reading it, especially for the atmosphere of enthusiasm for the subject which it communicates, my own experience of the Purple Emperor has not always been in agreement with the statements expressed in the book; in particular, the assertion on page 165 that "In captivity the insect lays only between 10 am and 2 pm (B.S.T.) and then only when the shade temperature exceeds 65°F. *in the morning*" does not correspond with my observations, since most of the egg-laying of my females occurred between 2 pm and 6 pm — indeed I have not observed a single instance where it occurred in the

morning. For this reason it would have been inadvisable for me to have followed the advice on page 164 to remove the female from the laying sleeve in the afternoon and not replace it until the following morning. My actual practice in this respect has been either not to remove it at all or wait until dusk when the butterfly is quiet and easily transferable to a different sleeve without disturbance to the egg-laying rhythm. I found the slightly different statement, to the effect that, in captivity, "ovipositing normally will take place only during the forenoon" had appeared earlier, on page 72; what caught my attention, however, was the immediately preceding remark: "In captivity, the female requires for ovipositing a certain degree of warmth: and also, *at all events in the sleeve, direct sunshine.*"(The italics are mine.)

Now, all became clear to me: my tub-grown bush had been in direct sunshine; so had my sleeved female in 1976; but after that I had been influenced by the remarks on page 102 of the same work to the effect that "in nature the female will lay her eggs exclusively on the north-east sector of those sallows, only, which are shaded from the south and west." The sallows which I used are on the southern boundary of my garden, lying in an east-west line. They have grown considerably since I planted them; and as the sleeves are always on the side away from direct sunshine and open to the north-west, north and north-east, they were in a favourable egg-laying orientation, according to Heslop, for females laying under natural conditions, but not for females enclosed in sleeves. However,this does not explain my success in obtaining 100 eggs in 1980; but, on reflection, I recalled that I had, in that year, lopped many of the branches of the sallows and completely felled two bushes which had become too intertwined. No doubt this had the effect, unrealised at the time, of allowing more direct sunshine to reach the sleeve. If the theory is correct, it could account for most of the erratic variations in my breeding results and, incidentally, might also account for Heslop's conclusion that eggs were not laid in captivity after 2 pm; if his sleeve was positioned so as to receive morning sunshine but none after 2 pm, all is explained.

Now, to return to the female caught on July 28th 1984, as mentioned at the beginning of this account. In the evening of the same day I placed it in a sleeve on an isolated sallow so as to receive direct sunshine in the afternoon. From the very next day I knew that matters were going to be different. I had never before had a female which commenced laying within 24 hours of being sleeved, but this one did, with ten eggs by 4.15 pm on the 29th, one at 5.06 pm and another at 5.08 pm, both of which I observed; by 5.24 pm the total was at least 22 and a count later that evening gave 37. Laying continued on the 30th and 31st, possibly also on August 1st and certainly on August 3rd, by which time the total had risen to 126. I observed laying at 3.27 pm on the 3rd and again at 3.25 pm on the 4th. The female died on August 10th, having laid so many eggs in the sleeve that counting had become difficult and I decided that it would be a more

profitable exercise to count the larvae when they hatched out from the eggs. The results of so doing were that I had counted 134 by August 22nd; on the 25th I distributed the larvae between 13 sleeves and found the total number to be 168. As this included the larvae from two eggs found in the wild on July 28th, the total complement of eggs laid by the female was 166. Three larvae died shortly afterwards, and on August 29th I redistributed the remaining 165 in 14 sleeves, as follows:—

12, 12, 11, 12, 11, 25, 12, 12, 11, 12, 5, 6, 12, 12.

More recently, viz. on May 13th 1985, I took a count of the post-hibernation larvae which had survived and resumed feeding. The result, in the same order, was as under:—

4, 8, 0, 0, 1, 2, 5, 5, 7, 6, 0, 3, 8, 4.

This total of 53 will give a success rate of 32.12%, no further casualties being sustained. It will be noted that the contents of the third, fourth and eleventh sleeves were completely lost, and that the sixth, originally containing 25 larvae, was reduced to only two. The explanation of these heavy losses probably lies in the fact that the third, fourth and sixth sleeves were torn, but I did not discover this until the winter had passed. It seems essential to the future improvement of the success rate that the number of sleeves should be increased to about 30, with no more than five or six larvae per sleeve.

To test the theory put forward in these notes I had hoped next to undertake a series of investigations into the comparative results of sleeving one captive female in morning sunshine and another in afternoon sunshine. If this regularly resulted in both females laying large quantities of eggs then the matter would seem to have been resolved. However, the opportunity to carry our such experiments has been frustrated by a succession of summers with unsuitable weather at the crucial ovipositing time, and, more recently,
with unsuitable weather at the crucial ovipositing time, and, more recently,
in 1988, by a new policy on the part of the Forestry Commission, of issuing collecting permits only to those individuals actively involved in "officially recognised research."

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Butterfly records from Dorset, 1988

The period 1.viii to 7.viii 1988 was spent at Studland in Dorset. During this time butterflies were recorded in the area on a casual basis. Over the week 30 species were seen and as this is such a large number we felt that a brief note would be appropriate.

Of the more widespread species *Pieris brassicae* L., *P. rapae* L. and *P. napi* L. were found throughout the region, though *P.brassicae* was

particularly common nearer the coast. *Thymelicus sylvestris* Poda, *Vanessa atalanta* L., *Aglais urticae* L., *Inachis io* L. were also generally common. A *V. atalanta* ab. *bialbata* Cabeau, which has a white spot in the red band of each forewing, was later reared from ova collected off nettle along the coastal path between Studland and Swanage. *Lycaena phlaeas* L. was also recorded at all the sites worked, though usually only as singletons.

By far the richest area for butterflies was the coastal path between Studland and Swanage. *Thymelicus acteon* Rott., *Cupido minimus* Fuess., *Cynthia cardui* L. (ovipositing on nettle), *Melanargia galathea* L., *Pyronia tithonus* L. and *Maniola jurtina* L. were common. Also present in lower numbers were *Aricia agestis* D. & S., *Polyommatus icarus* Rott., *Polygonia c-album* L., *Argynnis aglaja* L. (most frequent adjacent to Ballard Down) and *Lasiommata megera* L.

The one woodland site visited was Okeford Hill where *Ochlodes venata* Brem & Grey, *Pararge aegeria* L. and *Aphantopus hyperantus* L. were common. Among the few *Argynnis paphia* L. seen was one f. *valesina* Esp. A single *Quercusia quercus* L. was also recorded.

Other species noted were *Thymelicus lineola* Ochs. (one at Lulworth Cove), *Gonepteryx rhamni* L. (one at Arne and one at Winterborne Muston), *Plebejus argus* L. (one at Verne Yeates), *Lysandra coridon* Poda (abundant at Verne Yeates), *Celestrina argiolus* L. (a few at Studland) and *Hipparchia semele* L. which was present on all the sandy beaches and coastal sand dunes visited and was particularly common at Godlingston.

Sites mentioned in the text:
Ballard Down, SZ 045 813, Verne Yeates SY 695 733, Lulworth Cove SY 820 799, Studland SZ 038 827, Swanage SZS 031 795, Okeford Hill ST 82 09, Arne SY 972 887, Godlingston SZ 020 825, Winterborne Muston SY 882 973.

ADRIAN M. and DEBORAH K. RILEY, Longmynd, 35 Park Mount, Harpenden, Herts AL5 3AS.

A further Record of *Tinagma balteolella* F. v. R. (Lep.: Douglasiidae)

Our Editor's note in a recent issue (*Ent. Rec.* **100**: 152) prompts me to record another extension of this moth's range. Norman Heal caught some flying near the foodplant in a coastal area of East Sussex (v.c. 14) in 1985. My son and I visited the locality on 2nd August 1986 where we found the pink larvae of this species as well as those of the two *Ethmia* species (*E. terminella* Fletch. and *E. bipunctella* Fab.) that feed on viper's bugloss (*Echium vulgare*). I failed to rear the *balteolella* because I suspect, in what was a very late season, the larvae were too young.

Collecting some plants later in the year had not occurred to me! My thanks to Norman Heal for permission to publish his find.
R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Reigate, Surrey.

Some migrant lepidoptera in Wales, 1988.

I am pleased to record the capture of a Scarce Bordered Straw (*Heliothis armigera* Hubn.) and a Vestal (*Rhodometra sacraria* L.) at the foot of the cliffs just north of Clarach Bay, near Aberystwyth. The moths were taken within ten minutes of each other late on a sunny afternoon of September 9th 1988. Tribute must be paid to the extraordinary stalking skills of my friend Mr R.H. Clinton who boxed the very active *armigera* without a net. The only other migrant species noted was the pyralid *Nomophila noctuella* D. & S. — M.D. BRYAN, Keeper of Natural History, Birmingham Museum.

***Agriopis marginaria* Fab. (Lep.: Geometridae), the Dotted-border Moth caught in December.**

A single male of this species was caught in the Rothamsted Insect Survey light trap at Prestom Montford, Shropshire (Site no. 382, SJ 433, 143) on the night of 26/27 December 1987. *A. marginaria* usually flies between mid February and late April. — ADRIAN M. RILEY, Entomology and Nematology Deptartment, Rothamsted Experimental Station, Harpenden, Herts AL5 2JQ.

Some notable Coleoptera from Northumberland, including *Otiorhynchus arcticus* Fab. new to England.

A period of five weeks investigating the invertebrate fauna of National Trust land in north-east England during 1986 produced the following interesting beetle records:

Asaphidion pallipes (Duftschmid) (Carabidae), running over damp sand in sparsely vegetated river shingle by South Tyne on the Bellister Castle Estate at Haltwhistle (NY 694628), 21st August. This species was last recorded in the region in 1936 by W.F. Davidson, who took it at Slaggyford also by the South Tyne (M.D. Eyre, M.L. Luff, and S.G. Ball, 1986, *An Atlas of the Carabidae (Ground Beetles) of Northumberland and Durham.* Northumberland Biological Records Centre, Special Publication No.2).

Malthodes guttifer Kiesenwetter (Cantharidae), swept from heather and *Rhododendron* at the edge of pine plantation at NU 073031 on the Cragside Estate of Rothbury, 20th July; the same estate also produced *M. mysticus* Kiesenwetter, swept beneath birches lining Black Burn (NU 0802) and under alders by the River Coquet at Warton (NU 016023). Both these species, together with *M. flavoguttatus* Kiesenwetter, were swept beneath oak and birch woodland along Rothley Lake (NZ 0490), 24th July. *M. mysticus* was found at a third locality, on the Hadrians Wall Estate, where it was swept from ash trees growing on Peel Crags (NY 755676) and sallow and rowan by Crag Lough (NY 768679), 14th August.

Mycetophagus atomarius (Fab.) (Mycetophagidae), found beneath bark on fallen beech within the mixed deciduous woodland of Wallington Dean (NZ 027837), 19th August.

Asemum striatum (L.) (Cerambycidae), two beneath pine bark in plantation at St. Cuthbert's Cave (NU 059352), 28th July, near Wooler.

Mantura matthewsi (Curtis) (Chrysomelidae), frequent in turf of whin sill bank in Embleton Links (NU 241235), 4th August.

Rhinomacer attelaboides F. (Nemonychidae), one alighted on my shirt, Harwood Forest (NZ 0195), 27th July.

Otiorhynchus arcticus (Fab.) (Curculioidae), one beneath vegetation covering outcrop of whin sill, Beblowe Crag, Lindisfarne Castle (NU 136417), 28th July; *Trachyphloeus laticollis* Boheman was found in the same situation. *O. arcticus* is well-known just over the border in Scotland, but has never been reported in England before (M.G. Morris, pers.comm.).

O. desertus Rosenhauer, beneath debris of strandline between saltmarsh and sand dune by Long Nanny at Newton Links (NU 228270), 30th July.

My thanks to Dr M.G. Morris for information on the British distribution of *O. arcticus* and to Dr P. Hyman for confirming my identification. — K.N.A. ALEXANDER, National Trust, Spitalgate Lane, Cirencester, Glos. GL7 2DE.

A late or second brood *Cynaeda dentalis* D. & S. (Lep.: Pyralidae)

On September 9th 1988, whilst preparing to run an m.v. light on a grassy slope at Portland, Dorset, my brother Michael and I disturbed a specimen of the pyralid *Cynaeda dentalis*. Two further specimens later came to light.

Both Goater (*British Pyralid Moths*) and Emmet (*A field guide to the smaller British Lepidoptera*) indicate that the species is single brooded, with the imago flying in July. Two of the three moths captured were distinctly smaller (wingspan 20mm) than the specimens of this species we had collected in July of previous years in the same locality.

This late record would seem to indicate a possibility of a second brood in suitable years. — E.G. SMITH, Bullen Hill Farm, Ashton Common, Trowbridge, Wilts.

***Elenchus tenuicornis* (Kirby) (Strepsiptera: Elanchidae) in Cambridgeshire.**

Whilst sorting through a Malaise Trap catch (covering the period 9th to 13th June 1987) from the Middle Heath of Castor Hanglands National Nature Reserve, I found six male Strepsiptera. They were identified as *Elenchus tenuicornis* (Kirby) using Freude, H., Harde, K.W. and Lohse, G.A. (1969, *Die Kafer Mitteleuropas* **8**). I am grateful to Dr D.A. Sheppard

of the Nature Conservancy Council for checking this determination.

Seven further *E. tenuicornis* were subsequently found whilst sorting through catches from window traps. Following discussion with Dr R.C. Welch, it would appear that these finds represent a new county record for Cambridgeshire (v.c.32). — D.A.PROCTER, Nature Conservancy Council, 60 Bracondale, Norwich, Norfolk NR1 2BE.

Unusual behaviour of the Speckled Wood Butterfly.

Whilst walking down to Lulworth Cove, Dorset, on 17th September 1988, a stop was made by a small pond, some 20 x 30 metres in size. There was little wind, and the surface of the pond was smooth.

A speckled Wood (*Pararge aegeria* L.) was observed to fly close to the surface of the pond and dip into the water causing a small ripple. The butterfly continued in this manner, making a total of 10 dips, each one causing a ripple, before flying off to settle on low herbiage for a second or two. It then flew out of sight.

Was this insect taking on moisture or "playing" with the reflected image? — A.J. BALDWIN, 33 Defoe Avenue, Kew Gardens, Surrey TW9 4DS.

Immigrant Lepidoptera in Devon.

Whilst enjoying a late holiday at Bigbury in South Devon, I was fortunate to take a specimen of the Slender Burnished Brass, *Diachrysia orichalcea* Fab. The moth was disturbed from herbiage next to the moth-trap on the morning of October 4th 1988. The only other interesting immigrants noted were a brace of White-specks, *Mythimna albipuncta* Haw. taken on the previous night. Unfortunately, trapping was prevented by gale-force winds for the remainder of my stay in Devon. — M.D. BRYAN, Keeper of Natural History, Birmingham Museum.

***Acleris abietana* Hübn. (Lep.: Tortricidae) — records and foodplants.**

It was most interesting to read of Riley's records of *Acleris abietana* Hbn. from northern England (Riley, A., 1988. *Ent. Rec.* **100**: 186-7) and this has promted me to add other recent records and to refer to its foodplants.

Since this species was first recorded in Aberdeenshire in 1975 (Smith, P. and M.R. Young, 1977. *Ent. Rec.* **89**: 53) it has been found on a number of subsequent occasions, including once in the spring of 1978 by R.M. Palmer at Kirkhill Forest on the outskirts of Aberdeen city. Clearly, as Riley notes, the species does hibernate as an adult. Furthermore in 1982 I found pupae in characteristic spinnings on *Abies grandis* (grand fir) at Kemnay (Young, M.R., 1983. *Ent. Gazette* **34**: 87-8) and, although it is just possible that these resulted from larvae which had wandered from nearby *Picea abies*

(Norway spruce), it seems most probable that they had fed on the grand fir. The spinnings and signs of eating were plainly present.

Obviously this species is spreading in Britain, from a Scottish bridgehead and it would be most interesting to know what conifers it is using for a foodplant. On the continent it has been recorded from *Pinus, Abies* and *Picea,* according to Bradley, J.D., W.G. Tremewan and A. Smith, 1973. (*British Tortricoid Moths* **1**: Ray Society, London), but it seems a persuasive argument that, were all these genera used in Britain, then the moth might have spread more widely and quickly. No doubt it will come to use them here eventually, but does it do so now?

All the Aberdeenshire sites have grand fir present, at least in small numbers, and this also applies to the places mentioned by Riley. At Hamsterley Forest and Chopwell Woods in County Durham the Forestry Commission ranger, B. Walker, reports individual old trees and some 30+ year plantations, within 500 metres of the trap site; and at Kielder Forest the FC ranger, D. Kerr, has located 36 mature trees, again within 500 metres of the trap. It obviously cannot yet be ruled out that *A. abietana* is restricted to grand fir in Britain and it would be of great interest if larvae could be found on other conifers, including Norway spruce, as mentioned by Riley.

I am most grateful to B. Walker and D. Kerr for their help in locating grand firs near their trappery sites and to R. Palmer for his Aberdeenshire records. — MARK YOUNG, Department of Zoology, Aberdeen University, Tillydrone Avenue, Aberdeen AB9 2TN.

Hazards of butterfly collecting — Dhofar, October 1979.

When I visited Dhofar for the first time in 1979 to write a book on the butterflies of Oman, the province was fast developing. The civil war had been brought to an effective end in 1975 thanks to Sultan Qaboos' enlightened and well executed combination of civil and military measures, winning over the population. Only some fifty diehard rebels remained active (all known by name to the security forces), but they did manage to stage the occasional ambush or to murder stray soldiers or Europeans. Three oil rig workers had been killed a few months earlier on a beach not far from Salalah. A few areas could not be visited without military escort and some areas were mined.

I was planning to collect moths as well as butterflies. Since setting up mercury vapour lamps in the middle of the night in what is still a military zone in a complete wilderness could be considered unorthodox, I sought the advice of the Colonel in charge of that sort of affairs (my case was only mildly eccentric in comparison with many other requests). He arranged an escort to take me up to one of the permanent army pickets guarding the main Muscat-Salalah highway late in the evening.

The picket was manned by a platoon of Baluch soldiers. After some

polite conversation and a brief recce, I set up my moth gear. I had practised down in Salalah, so in no time the screen was safely wedged in the doors of the Landrover, the lamp suspended, and the generator going. The Lieutenant in charge was suitably impressed by my military precision. The moment the light came on in full force, moths swarmed to the screen faster than I could deal with them. It was some time before I reflected on the curious fact that although my visit must have been the most exciting thing to have happened at this picket since hostilities ceased, no-one came to watch, no-one offered to help. Only the occasional soldier would peer round my car for a moment or two. After about two hours the mess sergeant kindly brought me a mug of tea and I took the opportunity of asking the Lieutenant why his men were so shy:

"But don't you realise what a perfect target you make in front of that screen?" came the reply. "It isn't very often the rebels get a chance for shooting at night from a safe distance!" The Honda ran out of petrol a few minutes later and the light went out; I decided it would be too much trouble to refill it!

The following day I reviewed the situation with the Colonel, who conceded that the Lieutenant had an excellent point. New tactics were devised. I would go alone to remote places with no population and no army presence; I would stay no more than two hours; I would not visit the same place at night more than once. It was highly improbable that a stray rebel would have standing orders about what to do with an illuminated entomologist and two hours would be too little time for him to consult his superiors. This system worked well. E.P. Wiltshire tells me that he has found more than twenty new species of macroheterocera here and a few beetles and ant-lions have also proved new. But I never got rid of a tingling sensation in my spine every time I stepped in from of the screen. — TORBEN B. LARSEN, 358 Coldharbour Lane, London SW9 8PL.

Agonopterix carduella Hübner (Lep.: Oecophoridae) in October.

On the night of the 25th October 1988, while light trapping with Bernard Skinner in Folkstone Warren, Kent, I was surprised to see a good specimen of this local moth so late in the year. Its normal time of appearance and that given in the text books is July-August. So was this a partial second generation specimen, or does the moth hibernate as an imago? — J.M. CHALMERS-HUNT, 1 Hardcourts Close, West Wickham, Kent.

Stigmella samiatella Zeller (Lep.: Nepticulidae) in Kent.

This species seems to be on the increase in Britain (see Emmet, *Ent. Rec.* **88**: 315-318). Mr Ian D. Ferguson showed me an empty nepticulid mine on Spanish Chestnut that he had found on the 20th September 1986 near

Maidstone, Kent (v.c.15). Subsequently, he and I visited the locality later that month and collected a total of 15 empty mines on Spanish Chestnut. These were submitted to Col. A.M. Emmet, who kindly determined them as those of *S. samiatella*. These appear to constitute the first record of *samiatella* for Kent.

In 1988, some vacated mines on Spanish Chestnut that I had collected in the National Trust Reserve at Petts Wood, Kent (v.c.16) on the 21th September, were also determined by Col. Emmet as those of *samiatella*, and established the first record of this species for this vice county. I should like to take this opportunity to thank the National Trust authorities for permission to record microlepidoptera in the above reserve. — J.M. CHALMERS-HUNT, 1 Hardcourts Close, West Wickham, Kent.

Geometrid larvae feeding on bilberry (*Vaccinium myrtillus*) after descending from oaks.

At dusk on 12th June 1988, I was walking along the edge of an Exmoor wood in Devon. Larvae of *Agriopis marginaria* Fab., *Erannis defoliaria* Clerck and *Operophtera brumata* L. were abundant, feeding on bilberry. I also noted many larvae of the latter two species dangling by silk threads from oak trees. There were no larvae of any of these species on the bilberry away from the wood, and it is reasonable to conclude that the larvae found on bilberry had begun their life feeding on oak before descending from the trees. — Dr B.P. HENWOOD, 4 The Paddocks, Abbotskerswell, Newton Abbot, Devon.

The larva of *Oligia versicolor* (Borkhausen). (Lep.: Noctuidae).

On 17th April 1988 I found a larva feeding internally in the stem of cocksfoot grass *(Dactylis glomerata)* at Axmouth, Devon. On 30th April, the larva made a cocoon of withered grass sheaths. I opened the cocoon on 9th May, revealing a light brown pupa, 10mm in length. A female *Oligia versicolor* emerged on 13th June. According to Skinner (*Moths of the British Isles*), the larva of this species is apparently unknown.

Describing the larva from colour slides which I had taken, the general colour was purple above the black spiracles, and greyish-cream below. The thoracic legs, head and anal plate were brown and the prolegs greyish-cream. The setae were short and white and the pinacula black.

My thanks to E.C. Pelham-Clinton for confirming my identification of the moth. — Dr B.P. HENWOOD, 4 The Paddocks, Abbotskerswell, Newton Abbot, Devon.

***Hydrelia flammeolaria* Hufn. (Lep.: Geometridae) apparently breeding on alder near London**

Lepidopterists seem agreed that the foodplant of this pretty little moth (the Small Yellow Wave) is field maple in the south, but alder in the middle and

north, of its British range; the few authorities I have at hand, from Barrett (1902) to Skinner (1984), mention no known departure from the above rule. The former (*Lep. Brit. Isl.* **8**:198) was much struck by this unusual phenomenon and inclined to suspect the existence of two indistinguishable yet separate races differing in foodplant and habitat.

On 13th July 1988, I netted an example of the moth when sweeping amongst young alders in Oxleas Wood SSSI, Shooters Hill, S.E. London — the first I had seen for over 60 years. As was natural at that date, it was somewhat worn, but not badly. Maple occurs in these woods very locally and sparsely, and not near the spot in question; there is sycamore close by, but this seems unknown as a foodplant, and unlikely. The probability that *H. flammeolaria* is breeding on the alders just mentioned thus appears very strong, and should it be a fact, would seem to be of considerable interest in view of what has been said. I hope to obtain further evidence bearing on the matter next year. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

***Dienerella filiformis* Gyll. (Col.: Lathridiidae) in a S.E. London House.**

D. (Cartodere auct.*) filiformis*, to judge from the paucity of records, is still a rarity though less so than in former times. It is, then, perhaps worth reporting its recent occurrence here in my house: one specimen in a stack of papers (not mouldy) long kept in a corner of a room, crawling on one of the sheets (3.vi.88); and another in the bath over which an m.v. lamp is mounted, after the latter had been running for some hours (3-4.x.88). The bath forms a trap for many insects (the smaller ones especially) attracted to the light. The *Dienerella* may have been one such; however, it appears far likelier that it had not flown in from outside but was already in the house. *D. filiformis* mainly an indoor species with us, but my sole previous capture was in my former garden at Blackheath, where a single example was sifted from a pile of dead grass on 17.ix.54 (1955, *Ent. mon. Mag.* **91**:6). In my present house the common *Dienerella* is *separanda* Reitt., often to be seen in association with moulds, and occasionally accompanied by *Corticaria inconspicua* Woll. and/or *Mycetaea hirta* Marsh. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

CURRENT LITERATURE

Grasshoppers and Allied Insects of Great Britain and Ireland by **Judith A. Marshall** and **E.C.M. Haes** with illustrations by **Denys Ovenden.** 252 pp including 12 colour plates; 59 text figures; 102 maps; bookmark. 250 x 200mm. Boards. Harley Books, 1988. £25.00.

THIS is a comprehensive work on the native and established alien species

of Orthoptera (Bush-crickets, crickets, grasshoppers), Dictyoptera (Cockroaches), Dermaptera (Earwigs) and Phasmida (Stick-insects) of the British Isles including the Channel Islands. It fills a serious gap in the readily-available literature that has existed since *Grasshoppers, Crickets and Cockroaches of the British Isles* (D.R. Ragge, 1965) went out of print. Those fortunate enough to possess a copy of Ragge, or who have one on perpetual loan from their local library, will find that much progress has been made in the knowledge of distribution — due no doubt to enthusiasm generated by that book and also to the Orthoptera recording scheme of the Biological Records Centre that commenced in 1968. The opportunity has been taken to extend the coverage in this latest work to include the Dermaptera and, geographically, the Channel Isles while topics such as life history have benefitted from various studies conducted over the last two decades.

A foreword by David R. Ragge, acknowledgements and preface, precede an introduction (52 pp) covering a wide range of topics including nomenclature and classification, pronunciation of scientific names, common names, historical account of the study of Orthoptera, morphology, life history and development, song and courtship, predators, parasites and diseases, locating and collecting, rearing and culture, and preservation. Additional contributions by specialists are Distribution and History of the British Orthoptera, by D.R.Ragge (reproduced, with minor amendments, from Ragge, 1965), which examines the influence of climate, climate history, geology and vegetation; Recording Orthoptera Sounds, by J.F. Burton, and photography, by R. and C. Foord. The introduction closes with a select bibliography (which is supplemented by a more comprehensive reference section at the end of the book).

A systematic section (82 pp) follows and this includes a check list giving five levels of status, a key to adults, characteristics of Orders and Families, and extensive treatment of each species — description, life history and behaviour, song (where appropriate), habitat, distribution and status. The description of song is cross-referenced to the tape cassette which has been published as a companion to the book and which is reviewed separately. Distribution and status is given far more detailed treatment than was the case in Ragge (1965) — in some cases over half a page of text — and there are vice-county maps which divide records between pre-1961 and later. The information appearing under each species' heading is supplemented by an Atlas section (27 pp) comprising forty-eight 10km square dot-distribution maps (forty-three species, records for each of the four Orders, and one showing the number of species recorded as either 5-9 or more than 10). Yet more detail is offered in the appendices which include tables showing the species recorded on each of fifty-five offshore islands and in each vice-county. The author states that these tables are intended for photocopying and individual recording purposes and the symbols used are available in "Letraset".

The colour plates depict all resident species and some migrants and the quality is superb. Detail is fine, even down to the small black spines on the underside of the hind femora of *Conocephalus discolor*. Various scales are used, with the majority x 2. There are lifesize silhouettes for some species and additional line drawings of the head details of the Tetrigidae. Some nymphs are shown and, with two of them, the species they mimic. In all, there are over 150 colour illustrations.

A section on habitats (14 pp) is illustrated with two plates of colour photographs depicting twelve prime sites. The various types of habitats are described and the species associated with them are listed. There are sections on conservation and the use of Orthoptera as habitat indicators. An appendix lists twenty outstanding localities with notes on the status of each species to be found there. Most of the localities cover a large area (e.g. "The Central Cotswolds") but the best sites within them are mentioned in the text (about 750), alphabetically, with corresponding 10km or 100km grid references and vice-county numbers.

The plastic bookmark is given added usefulness by having a millimetre scale along one edge, and English and scientific names side-by-side — alphabetic order being given to English on one side and scientific on the other.

This book is a most worthy successor to Ragge, incorporating much recent knowledge. One senses that it has been prepared and published with similar enthusiasm to that which the authors clearly feel for their subject. It will be greatly appreciated by those with an established interest in the Orthoptera and will do much to widen their numbers.

Harry Eve

Sound Guide to the Grasshoppers and Allied Insects of Great Britain and Ireland. Audio-tape Cassette; Duration 28 mins. 3 seconds. Harley Books, 1987. £5.75.

THIS audio cassette serves as a companion to *Grasshoppers and Allied Insects of Great Britain and Ireland* reviewed above. There are 35 recordings covering 26 species and they were made by J.F. Burton (BBC), R. Margoschis, D.R. Ragge, W.J. Reynolds, I.C. Robinson, P. Rudkin, R.F. Savage, J. Skeel and the late G.F. Wade (BBC). The announcements introducing each recording are by David R. Ragge and the opportunity has been taken to use the classical pronunciation of scientific names close to that used on the Continent. The sound level is kept fairly even throughout so that it is not necessary to turn up the volume for the quieter species. The ultrasound of the Speckled Bush-cricket, *Leptophyes punctatissima*, was made audible by the use of a bat detector.

As to quality, much depends on the ear of the listener — the reviewer found it most satisfactory. Background noise has been well suppressed

although the faint bleating of a sheep adds to the atmosphere of one recording of the Dark Bush-cricket, *Pholidoptera griseoaptera*. The instructions suggest that Dolby should not be used.

Song recognition is a valuable means of detecting species and with the compact portable cassette players of today it would be no hardship to use these recordings in the field. It also gives us the opportunity to hear the rarer species and lament the fact that, soon, we may no longer be able to experience the nocturnal purring of the Mole-cricket in these islands.

Harry Eve.

Edward Charles Pelham-Clinton

10th Duke of Newcastle

IT IS with great sadness that we learn of the death of Teddy Pelham-Clinton on 25th December 1988, at the age of 68.

A distinguished microlepidopterist, his interest in entomology began at Eton, being encouraged by Nigel Wykes who was a master there (and whose autobiographical *Memoirs of an Aurelian* appeared in this Journal in 1979 (*Ent. Rec.* **91**: 225-233; 261-269)). After military service, he graduated from Trinity College, Cambridge and joined the Royal Scottish Museum in Edinburgh, where he remained until his retirement in 1981. He succeeded to the title of 10th Duke of Newcastle on 4th November 1988, much to the delight of the "popular" press, who were anxious to cast him in the role of eccentric butterfly collector. Nothing could be further from the truth — a thoroughly professional entomologist, he was meticulous in his observations and recording and contributed much to our knowledge of the British microlepidoptera. He added several species to the British list and his discovery of a gelechiid new to science in western Scotland led Povolny to name the species *Scrobipalpa clintoni*, in his honour.

Teddy was perhaps more widely known as an Associate Editor of *The moths and butterflies of Great Britain and Ireland*, in which series he was author of the families Opostegidae, Tineidae, Hieroxestidae, Choreutidae and Glyphipterigidae; co-author (with John Heath) of the Incurvariidae, and was currently working on the Elachistidae for volume 3.

His extensive collection has been bequeathed to the Royal Museums of Scotland, where copies of his diaries and notebooks already reside. He will be greatly missed by all those who knew him.

Paul Sokoloff

TO OUR CONTRIBUTORS

ALL MATERIAL FOR THE TEXT of the magazine as well as books for review must be sent to the EDITOR at 4 Steep Close, Orpington, Kent BR6 6DS.

ADVERTISEMENTS, EXCHANGES and WANTS to P.J. JOHNSON, B.A., A.C.A., F.R.E.S., 31 Oakdene Road, Brockham, Betchworth, Surrey RH3 7JV. Specimen copies will be supplied on payment of £1.20 Sterling.

CHANGES OF ADDRESS to C. PENNEY, F.R.E.S., 109 Waveney Drive, Chelmsford, Essex CM1 5QA.

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THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J.W. TUTT on 15th April 1890)

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THE KENTISH GLORY MOTH, *ENDROMIS VERSICOLORA* (L.) (LEP.: ENDROMIDAE), AT RANNOCH.

M. R. Shaw*

**National Museums of Scotland, Chambers Street, Edinburgh EH1 1JF.*

IN VIEW of recent papers in this journal by Marram (1981) and Pelham-Clinton (1982) commenting on the lack of recent records of *Endromis versicolora* (L.) from the Rannoch area, it is a great pleasure to record that I beat two larvae, each about 1.5 cm long, from a roadside tree of *Betula pendula* about 1 km NW of Tummel Bridge (9 km E of Kinloch Rannoch) on 17.vi.1988 in the company of Dr Graham E. Rotheray. The tree was about 4 m high, and a small batch of hatched eggs was quite easily found on the W side, roughly 1.5 m from the ground.

As Pelham-Clinton (1982) points out, the last known *E. versicolora* larvae from the Rannoch area were collected from *Alnus glutinosa*. It is clear from the Lepidoptera collection and notebooks of T.E.D. Poore, now in the National Museums of Scotland, that this was a regular food plant, or possibly the only food plant, in that area over several years until 1939, since when there seems to have been no record of *E. versicolora* from Rannoch at all. Poore's alder-feeding larvae came from two places at Rannoch: toward the eastern end of the south shore of Loch Rannoch by the Allt Druidhe, and from 'Moulinavadie'. M.E.D. Poore (*in litt.*) informs me that the latter refers to the area around a house marked on Ordnance Survey maps as Mullinavadie at NN 713612, only 4 km from the birch that yielded my two larvae. (The Allt Druidhe is some 11 km distant.)

Whether the present specimens are survivors of the original Rannoch population or descendents of more recent colonists is hard to guess. It may well be that a certain amount of birch-feeding has always gone on at Rannoch, even though I am not aware of firm records having been published. But perhaps only larvae on alder would have provided really convincing evidence for a continuous presence.

It is worth just recording here some experiments that I did following discussions with E.C. Pelham-Clinton around the time of his 1982 paper. Four larvae of *E. versicolora* 1-2 cm long collected from *B. pendula* at Muir of Dinnet, Aberdeenshire, on 24.vi.1984 were, on 28.vi, transferred singly to *A. glutinosa* in clean tissue-lined 13x8x6 cm clear plastic boxes. All four had fed substantially within 24 hr, and continued to do so until 1.vii. Then the four larvae were recombined and given a mixture of *B. pendula, B. pubescens* and *A. glutinosa* in roughly equal quantities in a larger (17x11x6 cm) box. Within 12 hr (overnight) all three plants had been eaten, but by 8.vii it was clear that, under these conditions, there really was a preference for *B. pendula* over the other two species, albeit a rather half-hearted one, and that *A. glutinosa* was fed on almost as willingly as *B. pubescens*. This says nothing about the preference of ovipositing females or

the cues they use, of course, but it does indicate that the larvae may be fairly tolerant of parental choice within these limits.

It would be interesting to hear of any previous records of *E. versicolora* larvae on *Betula* in the Rannoch area or, indeed, of any post-1939 records of its presence there whatever the foodplant.

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Observations on the queens of the ant *Lasius mixtus* Nyl. (Hymenoptera).

In September 1985 while examining colonies of the ant *Lasius flavus* Fabricius, several queens of *Lasius mixtus* Nylander were seen. Stone slates had been previously positioned on top of nest mounds of colonies of *L. flavus* in an area of chalk grassland at Aston Rowant National Reserve, Oxfordshire. Workers of *L. flavus* build galleries under these slates allowing periodic observations of the colony to be made by lifting the slate.

In September 1985 (after the main flight time for sexuals of the *Lasius* genus in Britain) a few dealate queens of *L. mixtus* were also seen under the slates. These queens tended to be located around the edge of the galleries. In the excited state of the colony (induced by lifting the slate) they were attacked by *L. flavus* workers but were not hurt.

In subsequent trials one of these *L. mixtus* queens was accepted by a group of previously queenless *L. flavus* workers and treated as a normal queen. The *L. mixtus* queen did not produce any eggs though, possibly due to an inadequate diet. Founding queens of *L. mixtus* do not have as swollen gasters as those of *L. niger* or *L. flavus* both of which can rear their first brood without assistance. Another *L. mixtus* queen was attacked and killed when placed with a group of *L. niger* workers.

Queens of *L. mixtus* have long been thought to found their colonies by adoption into colonies of *L. niger* and *L. alienus* Foerster although the evidence for this is not conclusive (Collingwood C. 1957. *J. Soc. Brit. Ent.* **5**(7), 204-214). Collingwood also observed colonies of *L. mixtus* in areas where *L. niger* appeared to be absent. No *L. niger* or *alienus* were observed in this area and the dominant ant species was *L. flavus*. It thus seems possible that *L. mixtus* may also start colonies by adoption into colonies of *L. flavus*. Because of the great similarity of the workers of *L. mixtus* and *L. flavus* a mixed colony of such workers would be extremely difficult to locate. As Collingwood points out further observations on this matter are desirable. — P.J. WRIGHT, Department of Biological Sciences, Keele University, Staffordshire ST5 5BG.

BEETLES AND BUGS ON A THAMES-SIDE WALL IN AUTUMN

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IN the mid- or late morning of 12th October, 1984, I paid a visit to the Thames "marshes" at Belvedere, N. Kent, to assess the entomological possibilities. However, as expected, the inroads of heavy industry and local development had left few suitable habitats, and nothing that could be called brackish marsh was to be found, at least in the part visited. Only some rough dry grassland remained, along with a (probably polluted) dike so steep-sided and choked with sedge as to be unworkable. Turning over stones and rubbish yielded but few species of little account. The weather alone was auspicious, being bright and warm with a light southerly breeze.

Fortunately, before deciding to give up, I happened to glance at the stone or concrete wall extending from that point east along the river for about half-a-mile, and was agreeably surprised to see a few small beetles settled thereon — surely a hopeful sign. (Cf. my earlier experience of beetles swarming on a sea wall, related in 1959, *Ent. Rec.* **71**: 217-220.)* And indeed from that moment my luck changed, for it quickly became evident that insects, mostly beetles, were sitting, walking, or settling in some plenty on the wall in the warm sunshine; and that I had chanced upon one of those rare occasions when insects are tempted into the air in quantity by exceptional weather conditions. The wall, at a guess some 4½ feet high, had a flat top about 12 inches wide — both the top and the south face (the outer one with respect to the river) being about equally favoured. One had only to work slowly along its whole length and back again, selecting the insects desired — or rather, those which permitted themselves to be taken. By the time of my return to the starting-point after about two hours, the numbers were noticeably dwindling with slightly rising wind. It was very clear that they were all coming from the Kent side (with the breeze) and not from across the Thames; hence the scarcity of species associated with muddy river banks or brackish marsh. Further, certain of those noted were very much out of their normal macro-habitat and can only have come from some distance away to the south.

Needless to say, the ensuing list, while doubtless a fair sample of the species present, must be very incomplete; but, as general in such cases, includes some surprises. Not the least interesting feature of the whole episode was the time of year, October being, as a rule, decidedly late for a mass flight of this kind. The more notable species (for whatever reason) are marked with an asterisk. The following symbols are used as very rough indications of relative frequency: I, 2; r. = few or rare, c. = common.

* I there pointed out (p.219, footnote) that the identity of one species listed, an *Atheta* sg. *Microdota,* was doubtful and under review. The specimen has since been determined as *A. (M.) minuscula* Bris. (= perexigua Shp.), a rare species possibly not on record for E. Kent but which I have from W. Kent.

COLEOPTERA

Carabidae: *Leistus spinibarbis* F., I; *Notiophilus rufipes* Curt., I; *N. substriatus* Wat., c.; *Trechus 4-striatus* Schr., I; *Bembidion lampros* Hbst., I; *B. minimum* F., I; *B. 4-maculatum* L., I; *B. varium* Ol., I; *B. lunulatum* Fourc.; *Harpalus affinis* Schr., c. (at base only); *Microlestes maurus* Stm., I; *Dromius angustus* Brul.,* I; *D. 4-maculatus* L.,* I;

Hydrophilidae: *Helophorus obscurus* Muls., r.; *H. brevipalpis Bed., I; Cercyon melanocephalus* L.; *Megasternum obscurum* Marsh.

Staphylinidae: *Acrolocha sulculus* Steph. (an autumn species); *Omalium caesum* Grav., I; *O. exigum* Gyll.,* I; *Siagonium quadricorne* Kby.,* I; *Carpelimus bilineatus* Steph., I; *Anotylus inustus* Grav., c.; *Stenus aceris* Steph., I; *Gyrohypnus fracticornis* Müll., I; *Xantholinus linearis* Ol.; *X. longiventris* Heer; *Othius laeviusculus* Steph.; *Philonthus concinnus* Grav., I (with an extra puncture in each discal row); *Gabrius pennatus* Shp.; *Ocypus olens* Müll. (rather c. at base only); *Quedius boops* Grav., I; *Q. cinctus* Payk., I; *Q. obliteratus* Er., I; *Q. semiaeneus* Steph.; *Q. semiobscurus* Marsh., c; *Q. schatzmayri* Grid., I; *Habrocerus capillaricornis* Grav., I; *Sepedophilus nigripennis* Steph. (*lividus* auct.), I; *Tachyporus nitidulus* F., c.; *Oligota pumilio* Kies., I; *Atheta atramentaria* Gyll.; *A. longicornis* Grav.; *A. nigra* Kr., I; *A. sordida* Marsh.; *Amischa analis* Grav.; *Chilopora longitarsis* Er., I; *Oxypoda lurida* Woll.*

Scydmaenidae: *Eutheia schaumi* Kies.*, I.

Scarabaeidae: *Aphodius contaminatus* Hbst., r.

Throscidae: *Trixagus elateroides* Heer* (not rare); *T. obtusus* Curt. (fewer).

Nitidulidae: *Carpophilus ligneus* Murray*, r.; *Epuraea unicolor* Ol., 2.

Cryptophagidae: *Cryptophagus pilosus* Gyll., I; *C. postpositus* Sahlb.*, I (male).

Phalacridae: *Stilbus testaceus* Panz.

Coccinellidae: *Stethorus punctillum* Weise; *Nephus redtenbacheri* Muls., 2; *Exochomus 4-pustulatus* L., I; *Adalia bipunctata* L.; *A. 10-punctata* L.; *Adonia variegata* Gz.; *Thea 22-punctata* L.

Lathridiidae: *Aridius bifasciatus* Reitt.; *Corticarina fuscula* Gyll.

Anthicidae: *Anthicus antherinus* L., r.

Chrysomelidae: *Psylliodes chrysocephala* L.

Apionidae: *Apion confluens* Kby., c.; *A. aenum* F., I; *A. radiolus* Marsh.

Curculionidae: *Hypera postica* Gyll., 2; *Ceuthorhynchidius rufulus* Duf.*, 2; *Ceuthorhynchus picitarsis* Gyll.*; I; *C. pollinarius* Forst., 2.

HEMIPTERA

Acanthosomatidae: *Cyphostethus tristriatus* F.*, 2.

Pentatomidae: *Piezodorus lituratus* F.*, I.

Lygaeidae: *Kleidocerys resedae* Panz.; *Peritrechus nubilus* Fall.* c.;

Drymus sylvaticus F.; *Stygnocoris fuligineus* Geof.

Tingidae: *Derephysia foliacea* Fall., I; *Acalypta parvula* Fall., I.

Cimicidae: *Anthocoris nemorum* L.; *Lyctocoris campestris* F., r.

Miridae: *Notostira elongata* Geof.: *Lygus maritimus* Wagn.; *Orthops cervinus* H.-S.

Saldidae: *Saldula saltatoria* L., I.

Delphacidae; *Asiraca clavicornis* F.*, r.

To conclude with a few comments: the apparent absence of certain very common and expected species is balanced by the presence of others of which quite the reverse is true. An example is the occurrence of the uncommon *Ceuthorhynchidius rufulus* (2), whilst the ubiquitous *C. troglodytes* was not seen. *Carpophilus ligneus,* of which three specimens were found, is probably the most notable; no record being known to me since I published the first British occurrence in the open in 1941 (see Allen, *Ent. mon. Mag., in press*). The two *Dromius* species are subcortical insects which one would not expect to see at large at some distance from any trees. Similarly the two shieldbugs *C. tristriatus* and *P. lituratus* were quite out of their element, their foodplants — juniper or cypress, and gorse, respectively — being nowhere at hand. The former may be a new record for the S.E. London area. The apparent paucity of *Atheta* spp. is strange, but a good many of these small active Staphylinids may have escaped capture, or been overlooked. More surprising is the high representation of the genus *Quedius* (six spp.) compared with a single *Philonthus,* an equally large genus. *Q. semiaeneus,* it is worth remarking, is largely associated with the coast; and evidently also spreads up tidal rivers, since besides these I have taken one by the Thames at Charlton Reach. (The closely similar *Q. schatzmayri* on the other hand seems general.) Among the few weevils, it is pleasing to find that the scarce *Ceuthorhynchus picitarsis* survives at Belvedere, whence, as also from neighbouring Erith, it used to be recorded by the old collectors under the name of *C. tarsalis* Boh. (*Ent. mon. Mag., passim*).

Baris laticollis (Marsham) (Col.: Curculionidae) as a pest of cultivated cabbages.

About the middle of May 1988, the leaves of several small cabbage plants in our garden allotment at Epsom, Surrey started to turn yellow. Examination of the soil immediately around the base of the plants revealed numerous examples of the weevil *Baris laticollis* gnawing into the stems at the junction with the root. Practically all the plants in one row were being attacked in this way as were several in an adjoining plot. There were usually two or three of the weevils at each plant but one plant had seven weevils eating into its stem.

During the next few weeks, many of the affected plants died. Others became stunted and discoloured. At the end of June, smaller numbers of weevils were still to be found at the base of affected plants which had not received any treatment. At this time, sections of the stems at ground level revealed numerous weevil larvae. These were stout, legless grubs, tapering towards each end, arcuate in shape and white except for the head which was pale brown and the mandibles which were dark brown.

When my friend Mr H. Mendel visited me at the end of July, however, adult weevils could not be found but larvae were still present in affected stems. He took some home and told me that adult weevils started to emerge at the beginning of September. A stem was broken open soon after that and contained adults which were mostly teneral and pupae. Presumably in the wild the beetles overwinter as adults which appear again in the spring.

As it happens, this was not the first appearance of this species on our allotment; a single specimen was found at the base of a small cabbage plant in May 1976 and another in a similar situation in March 1977. On neither occasion, however, were the relevant plants adversely affected. Cabbages and other cultivated brassicas have been grown on the particular plot for at least 12 years and the whole area has been the site of garden allotments for a great deal longer.

In Britain, *B. laticollis* is a very local species, occurring mainly in the southern and south-eastern counties. It is reported (Fowler, 1891; Joy, 1932) to be associated with Cruciferae, especially *Sisymbrium officinale* (L.) but there are also references in the older literature to the weevil as a pest species. Fowler records that 'the larva has been observed in the stems of the cultivated cabbage' and Theobald (1912) refers to the weevil causing damage to cabbages in Cornwall, Devon and Co. Wexford. I know of no more recent record of the weevil as a pest in Britain. Balachowsky and Mesnil (1936), refer to various species of *Baris*, including *laticollis*, as a pest of cultivated cabbages in France and Lohse (1983) also states that the species can damage cultivated brassicas.

I thank Mr Mendel for letting me report his successful rearing of the weevil from larvae in affected stems, Dr M.G. Morris for providing a copy of the relevant portion of Theobald's report and Mr A. Halstead for drawing my attention to the work of Balachowsky and Mesnil.

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POSSIBLE ORIGIN OF THE MIGRATORY *CYNTHIA CARDUI* L. (LEP.: NYMPHALIDAE)

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PUBLISHED reports of northward-migrating painted lady butterflies, *Cynthia cardui*, in the spring of 1988 suggest the butterflies may have originated to the south of mainland Europe. They include a description of a "steady stream" flying north at Marrakech, Morocco, in March (Simson 1988), a movement north in Portugal in April that lasted several days (Larsen 1988), and a northward movement in southern France in April (Goater 1988). The butterfly is also reported in April as migrating near Florence, Italy, but no flight direction is given (Campbell 1988).

I visited Lanzarote in the Canary Islands between 17 and 24 February 1988 and found *C. cardui* extremely abundant all over the island in almost all habitats. There was no sign of migration and the butterflies were breeding on every suitable patch of thistles (several alien species) and mallow, *Malvus sylvestris* (also an alien). In some places larvae occurred at a density of more than $50/m^2$. Three-quarters of a sample of 18 were parasitised by *Cotesia vanessae* (Reinhard), a braconid in the *Apanteles glomeratus*-group, and the same species found parasitising *C. cardui* in Crete in December 1985 (Owen 1987).

Evidently *C. cardui* is unable to hibernate or aestivate at any stage of its life cycle and so must breed throughout the year. Large-scale winter breeding occurs on Crete and Madeira (Owen 1987), and the island of Lanzarote can now be added. I do not know of large-scale winter breeding on the European mainland or in north-west Africa, although the possibility remains, especially in Morocco, as suggested by Larsen (1988). The Atlantic islands (the Canaries and Madeira) are especially suitable for winter breeding as the climate is mild and oceanic and there is often sufficient rain to promote a good growth of herbaceous plants. Indeed, in February 1988 the desert island of Lanzarote was green and lush and there was a profusion of flowers, making it extremely suitable for insect life. I suggest therefore that the main winter breeding areas of *C. cardui* are islands rather than the mainland where the winter is apt to be relatively cold, and that islands are the main source of butterflies that fly north in spring. Much the same may apply to certain other migratory Lepidoptera. On Lanzarote in February 1988 *Colias croceus* Fourcroy, *Heliothis peltigera* (D. & S.) and *Autographa gamma* (L.) (which was breeding on a variety of herbaceous plants) were abundant, and smaller numbers of *Vanessa atalanta* (L.), *Hyles lineata* (F.), *Spodoptera exigua* (Hübner) and *Nomophila noctuella* (D. & S.) were also seen, which is a wide selection of species known to migrate north in spring.

On Lanzarote *C. cardui* was breeding entirely on alien plants; indeed it seems likely that there are no native plants available to support a large breeding population. If, as suggested, the island is a major source of northward-migrating *C. cardui*, its importance as a winter breeding area has existed for only the last five hundred years or so, during which time many plants were deliberately and accidentally introduced by Europeans.

Acknowledgement

The braconid parasites were identified by Dr Mark Shaw.

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Cacoecimorpha pronubana **(Hübn.) (Lep.: Tortricidae) in North-East England.**

I am presently looking at a collection of microlepidoptera from Durham and Northumberland, assembled by Michael Eyre of Newcastle University, the purpose being to identify and deposit records with the Biological Records Centre.

Two specimens of *Cacoecimorpha pronubana* (Hübn.) were immediately evident because of their bright orange hindwings. The labels read "Spital Tongues, 9.vi.81". Spital Tongues is an urban district near the centre of the city of Newcastle upon Tyne, most of the houses having typical Victorian/Edwardian small gardens with lots of evergreen shrubs like laurel, privet, holly, etc. This is a typical habitat for the species which, I understand, has been spreading northwards since its arrival on the south coast in 1905. The most northerly record of specimens caught in the wild, that I am aware of, is from Hoylake (Cheshire) in 1936 (*Ent. Rec.* **65**: 74-76; Michaelis 1953). There are more northerly records, for example in 1979 from Midlothian where larvae were recorded on spruce under polythene at a Forestry Commission Research Station (Winter, 1982. *Entomologist's Gaz.* **33**: 229-230), but whether these plant nursery examples are acceptable as evidence of northward spread is debatable. — T.C. Dunn, The Poplars, Chester-le-Street, Co. Durham.

HAPLOGLOSSA PICIPENNIS (GYLLENHAL) (COL.: STAPHYLINIDAE) IN OSPREYS' NESTS.

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WE previously reported the occurrence of *H. picipennis* in material from an osprey's nest obtained some months after the end of the nesting season (Carter, Owen and Taylor, 1980). On a number of occasions subsequently it has been possible for one of us (S.T.) to collect, at the time young ospreys were being ringed, a small portion of nesting material from this and 13 other nests. The latter were sited in altogether 10 different 10 km squares. In some cases, it was possible to obtain samples of nesting material on up to three sucessive years from the same nest. In all, 32 samples of nesting material were obtained.

H. picipennis was found in 18 samples of nesting materials and was present at one time or another in all but 3 of 14 nests. Sometimes the beetle was present in considerable numbers. Thus a sample of material (about 2000 ml) collected from the Loch Garten nest in July 1988 contained 133 beetles — all *H. picipennis*. At this time, the osprey's nest was of average size, roughly cylindrical about 1 m in diameter and 1 m in depth so that if the sample removed was representative of even a portion of the nest, the beetles present in the whole nest must have numbered thousands.

H. picipennis occurs almost exclusively in nests of birds of prey. In Britain, it was originally reported from two buzzards' nests collected respectively in Devon and Wales (Joy, 1930). More recently, the beetle was found in a sparrow hawk's nest in Inverness-shire (Welch, 1978). It has always been regarded in Britain as a rare species and has been graded Red Data Book category 2 (Shirt, 1987).

Our findings indicate, however, that in Britain as elsewhere — see eg Horion (1967), Palm (1972), Freude (1974) — it may be present in large numbers in a particular nest. Horion (loc. cit.) cites an instance where ca. 6500 adults, ca. 2000 larvae and remains of ca. 1000 adults were found in one buzzard's nest. What proportion of the British population of the beetle occurs in the nest of ospreys, as distinct from other raptors, is unknown but as there are currently over 50 osprey nest sites in Scotland, the total population associated with ospreys' nests alone is likely to be quite considerable. Ospreys' nests are normally occupied year after year and this may offer the beetle more stable breeding sites than the smaller nests of buzzards and sparrow-hawks which tend to be re-used every few years rather than every season. However, the nests of raptors such as buzzards and sparrow-hawks were presumably important in maintaining a population of the beetle in Scotland during the 50 years or so up to 1955 when the osprey did not breed in Britain.

What the larvae of *H. picipennis* eat has not been determined. The sample of nest material collected in 1988 (which had 113 adults) contained 72 aleocharine larvae, variously sized but otherwise identical. We presume these to have been larvae of *H. picipennis* for their morphology was consistent with that of larvae of this genus (P.M. Hammond pers. commun.) and no other beetle species was present. It has been suggested that the larvae of this and other members of the genus are predatory on larvae of fleas or flies but no fleas or flea larvae were apparent in this sample of nest material though small numbers of one or other were sometimes observed in other samples of osprey nest material. The lack of fleas, or at any rate their scarcity, in this instance may have been due to the fact that this was the first time in four years that there had been young ospreys in this nest. A few fly larvae were present but not in anything like sufficient numbers to have sustained the number of beetle larvae present. Indeed, it is difficult to see what the larvae had been eating unless it was some sort of nest debris such as desquamated epidermis and feather scales from birds. Other members of the genus are known mainly from the birds' nests but some, eg *H. pulla* (Gyllenhal) occur in ants' nests where fleas occur only as vagrants.

Addendum

After this note was submitted, an unexpected opportunity arose to examine some material from the nests of other raptors. This comprised material from three buzzards' nests and one sparrow hawk's nest from the Abernethy region, together with further material from the osprey's nest at Loch Garten. It was collected by one of us (S.T.) in November 1988. The sparrow hawk's nest, the osprey's nest and one of the buzzards' nests had been occupied during the 1988 season, one buzzard's nest had been occupied in 1987 but not 1988 and one had not been occupied since 1984.

Examples of *H. picipennis* were present in all but the last nest. Only single examples were detected in each of the nests which had been occupied in 1988 but the buzzard's nest which had not been occupied for 18 months produced five examples. No fleas or flea larvae were found in any of the nests but there were larvae of diptera in the buzzards' and sparrow hawk's nests and lepidopterous larvae in the buzzard's nest not occupied for 18 months.

In Scotland, ospreys' nests may be a major breeding site for this beetle but our recent findings confirm that other raptors' nests could provide breeding facilities in the absence of ospreys' nests. The presence of examples of *H. picipennis* in a nest that had not been occupied for 18 months, (assuming, as seems likely, that the beetles had bred in the nest), is of some interest and has to be taken into account in any thesis regarding the beetle's detailed biology.

Acknowledgement

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Bembidion (Lymnaeum) nigropiceum Marsh. (Col.: Carabidae) in West Kent.

I have been unable to find a published record of this very local maritime species for West Kent, in the extreme east of which — at Allhallows-on-Sea — I took a specimen as long ago as 1937 (28.iii) from under seaweed on the sandy shore. Through an oversight it was never recorded. I have been reminded of this by the recent capture of another (16.viii.88) a little farther round the coast of the Isle of Grain, under a piece of board on the sand about high water-mark, when in the company of my good friend Prof. J.A. Owen — to whom I am indebted for the opportunity of revisiting the area after so long. The V.C.H. list for Kent (Fowler, 1908) gives only Whitstable for *B. nigropiceum*. It is not in J.J. Walker's list for the Isle of Sheppey (1932) and must be one of the few beetles, apart from one or two added to our list in later times, to be found in the Thames Estuary area but not, apparently, on Sheppey. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

Diplocoelus fagi Guér. (Col.: Biphyllidae) in S.E. London.

Whilst evening sweeping under trees (mostly oaks) on a thinly wooded slope in the western portion of Oxleas Wood SSSI at Shooters Hill, 20.vi.88, I was surprised to find in my net an example of this beetle. The species usually occurs under bark of beech, a tree not present on the above slope; and is not otherwise known, I believe, from the immediate environs of London. For many years it was regarded as a rarity confined to the New Forest, but early this century was taken near Oxford and in Berks (Streatley), and during the 1930s and 40s began to be found also in a series of localities more to the south-east, including Windsor Forest, and in W. Sussex, Surrey, and E. and W. Kent; and finally in Gloucs and Suffolk. I do not know the full extent of its present range, but have it from Savernake Forest, N. Wilts (1960) which

possibly is a new county record (?). The closely-allied *Biphyllus lunatus* F., also, was taken for the first time in the London area not long ago (Allen, 1981, *Ent.Rec.* **93**: 90). — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

A notable beetle from South Somerset and two further notable records from Bracketts Coppice. Halstock, Dorset.

On 29.viii.1987 one specimen of *Ilyobates nigricollis* (Paykull) (Col.: Staphylinidae) was found in some leaf litter collected from Dommett Wood, Buckland St. Mary, S. Somerset (ST 21). The litter was from only about 10 to 15 metres from a wet *Betula/Sphagnum* area at the lower end of the wood and was quite moist. The rather shiny thorax of the beetle seemed to me to indicate *I. nigricollis* rather than *I. subopacus* Palm. Nearly a year later on 15.vii.1988, I took home some samples of *Sphagnum* from the lower area and was very surprised to take another similarly shiny *Ilyobates*. This sample was mostly *Sphagnum* but with some birch leaves also, which were in amongst the moss, and was taken from a slightly lower and much wetter site about 20 to 30 metres away from the previously taken beech litter sample. I have taken no other samples from this area, but two specimens from two samples suggests that the beetle may be not uncommon in that area. A few Myrmicine ants were found in the sample of *Sphagnum* and there would be nests in the area, though not in my sample. No ants were noted in the beech litter sample. It is interesting that Palm (*Svensk Insektfauna* **53**: 334, 1972) states that unlike *I. subopacus, I. nigricollis* is sometimes found in pure *Sphagnum*.

When searching for beetles from Bracketts Coppice, Halstock, Dorset (ST 50) in 1988 I investigated some stony areas by the side of the stream which runs through the wood in a shallow wooded gorge. At about 10.30 am on 10.v.1988 I found a number of rather brightly red and black medium-sized Staphylinids hiding under the stones. Once captured they could readily be identified as *Deleaster dichrous* (Gravenhorst). When disturbed they ran off with their abdomens raised more or less vertically, but none attempted to fly when disturbed and none were seen flying elsewhere in the wood, although the morning was sunny. They occurred in two spots investigated and were still present on 17.v.1988 but had all disappeared on 27.v.1988.

On 27.v.1988 I swept a fine specimen of *Osmylus fulvicephalus* (Scopoli) (Neur.: Osmylidae) from herbage under the trees near this stream. This was a very unexpected find and seems worthy of record.

I am indebted to Prof. J.A. Owen (Epsom) and to Colin Johnson (Manchester) for confirming the identification of the *Ilyobates* and to the Dorset Naturalists Trust for continued permission to collect in Bracketts Coppice. — P.D. ORTON, 22 Lyewater, Crewkerne, Somerset TA18 8BB.

THE EVIDENCE FOR BIVOLTINISM IN *EUPITHECIA TRIPUNCTARIA* H.-S. (LEP.: GEOMETRIDAE) IN SOUTH EAST ENGLAND

B.K. West, B. Ed.

36 Briar Road, Dartford, Kent.

THERE appears to be uncertainty regarding both the time of appearance and voltinism of this moth, the majority of the standard textbooks giving the flight time as May and June in a single brood. That is the situation according to Edward Newman 1874, L.W. Newman and Leeds 1913, R. South 1939 and the British Entomological and Natural History Society monograph 1981. South, however, adds that a second brood may be obtained in captivity, this emerging in July. The latest textbook, by B. Skinner, is at variance with these by stating that the moth 'has been recorded in every month from May to September', adding that the larvae have been found feeding on elder flowers (*Sambucus nigra*) in July as well as on the usual umbellifers in August and September. The author, perhaps wisely, does not commit himself on the question of voltinism; additionally the July feeding larvae from elder did not as expected produce moths later in the season, but emerged the following year.

Now in general much of what appears in twentieth century textbooks can be traced to the works of C. Barrett; curiously this is not so regarding *tripunctaria*, for Barrett gives the species as being bivoltine, appearing at the end of May and in June, and again from late August to October.

There have been two references to these contradictions in recent years in this journal. In a brief note G. Prior (1978) complains that the literature he has consulted states that *tripunctaria* is bivoltine, yet he is unaware of the larvae being 'found in the Spring', and therefore there is no evidence of bivoltinism. Brig. E. Simson (1980) adding Meyrick to the list of textbooks giving a single brood in May and June considers the circumstantial evidence sufficient to suggest that the moth is bivoltine — this evidence being his noting two distinct emergences, in May and June and again in July, and the unlikelihood of eggs laid in May remaining dormant until the *Angelica* seeded in September.

Although I have collected larvae in Kent and bred the moth on several occasions, I have become more acquainted with the species as it has become a frequent visitor to my garden m.v. light in recent years, although it was at best a casual visitor from 1969 until 1983. In 1988 the light has been operated on almost every night from early April until November, apart from ten days in late May, and a few unpropitious nights during the Autumn. *Tripunctaria* was first seen on May 8th and 14th, then each night from June 11th until the 15th and again on the 21st — ten specimens in all. It next appeared on July 20th, 21st and 25th, and then every night from August 1st to the 8th, and finally on the 23rd and 26th, in all more than

thirty specimens. Especially in the second sequence, a deterioration in the specimens' condition was evident.

In 1987 the light was run for a total of only six nights in May and June, and *tripunctaria* was not seen until August 7th, and in all fifteen specimens were noted up to the 22nd. In 1986, despite opportunity, no specimens were noted until a singleton on July 14th, to be followed by about a score between August 5th and 22nd. In 1985 a total of three specimens were noted on May 20th, June 13th and 15th to be followed by five more on August 13th, 17th (two), 18th and 29th. 1984 provided but a single individual on August 14th, and 1983 a singleton on June 1st with ten more between July 25th and August 14th; however in both these years the light was operated on only four and two nights respectively in May.

Chalmers-Hunt (1981) has numerous records of *tripunctaria* for Kent, and these show a similar pattern to mine: four records are given for April, May and June, a single one for mid-July, and about a score for August and September. L.K. and K. Evans (1973) for N.E. Surrey depict a similar picture — four records for June and seven for August and September. No further comparison can be made in the absence of similar local works on the macro-lepidoptera of neighbouring counties — Essex, Sussex and the remainder of Surrey, and even further afield; however, a very good summary of expeditions made to Co. Clare is published by Bradley (1967), and although these were made in every month from April to the end of September, *tripunctaria* is noted for the Burren only in June and September. Two records of significance appear in this journal — Peet (1965) and Agassiz (1977), referring to specimens seen in Co. Cork in May and late August respectively.

I believe the above observations sufficient to suggest that *tripunctaria* is bivoltine in Kent, the Burren of Co. Clare and Co. Cork; in Kent the moth appears to be commoner in the second brood, but this may be illusory, merely reflecting the relatively greater number of nights in August conducive to the insects flying.

I realise that the observations quoted do not satisfy Mr. Prior's contention that *tripunctaria* larvae have not been discovered in the Spring; however this seems to be irrelevant — what is required is the finding of larvae resulting from the May and June moths to produce imagines in late July and August, and surely the time to search for these is late June and July, ie early Summer. In the meantime the observations I have noted above indicating that there is a distinct gap between two sequences of emergences and Brig. Simpson's point regarding dormant eggs remain as very good circumstantial evidence for bivoltinism in this species, and that this is sufficient one may compare *tripunctaria* with *Xanthorhoe designata* Hufn. In 1874 Edward Newman stated that the moth flew in May and June, and again in August and September, ie was double brooded; and he

also mentioned that the caterpillar was figured in Sepp's work on Dutch lepidoptera, being represented feeding on a species of cabbage. C. Barrett went a step further: of the larva he states "June and the beginning of July, and a second generation at the end of August and in September, on cabbage and other Cruciferae — yet cabbage cannot be its natural foodplant in the wild state, since it does not frequent gardens, and there is little doubt that it lives on those species of cress which are found in damp woods", and this tale has been repeated in subsequent textbooks until finally B. Skinner just states that the larvae will feed on certain cruciferous plants in captivity. Feral larvae of this species have not, I believe, been found in Britain, but that the moth is bivoltine in parts of Britain has been accepted at least since the time of Edward Newman on the same sort of circumstantial evidence as has been put forward by myself and Brig. Simpson in respect of *Eupithecia tripunctaria*.

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Another Record of *Brachypalpus laphriformis* (Fallen) (Diptera: Syrphidae).

A female specimen of *B. laphriformis* was taken inside a sun-lounge window at Kendal Wood, New Hutton, Cumbria (SD 540912) on 8 June 1988. This species is rare in northern England and I do not know of any recent records for this species in this district. Previous records for VC 69 are:- Holker Moss (SD 345 795) where two specimens were taken by the late J. Davis Ward on 5 June 1922. Specimens were taken by the late A.E. Wright at Grange-over-Sands on 2 June 1934 and at Witherslack on 31 May 1934. The exact localities of Wright's specimens ae not noted in his record

books (which are in my possession). Nor are the details of Ward's specimens except that in his diaries he records one specimen as having been taken at rest on a tree trunk. Various authors state that *B. laphriformis* is associated with ancient woodland. In the north of England little of this kind of habitat occurs now. Is it possible that the species occasionally migrates? The scarcity of records may also be owing to the remarkable resemblance of the fly to the common hive bee thus causing it to be overlooked. — DR. NEVILLE L. BIRKETT, Beardwood, Carter Road, Grange-over-Sands, 4 November 1988.

Immigrant Moths in Guernsey, Autumn 1988.

After a dismal season for migrants with only single examples of *Spodoptera exigua* Hübn. on 19th July and 27th August, and *Rhodometra sacraria* L. on 15th September coming to the m.v. trap in my garden, a spell of mild autumnal weather produced a few suprises. The period from 15th October to 29th October produced *Agrius convolvuli* L. (1), *Mythimna vitellina* Hübn. (8), *Heliothis armigera* Hübn. (7), *Spodoptera exigua* (5), *Orthonama obstipata* Fab. (4) and *Cyclophora puppillaria* Hübn. (1). Throughout this period *Nomophila noctuella* D. & S., *Udea ferrugalis* Hübn. and *Autographa gamma* L. were common. This was at a time when red Sahara dust was falling on Guernsey and, according to the newspaper, live Sahara locusts were falling on Plymouth. The night temperatures then suddenly dropped to a little above freezing and no further migrants were seen until 11th November when another mild night produced two more specimens of *Orthonama obstipata* and one of *Palpita unionalis* Hübn. — P.D.M. COSTEN, La Broderie, Route de la Claire Mare, St. Peters, Guernsey.

Some new and notable Lepidoptera records for Yorkshire.

A specimen of the Varied Coronet moth, *Hadena compta* D. & S., was taken Andrew Wilkinson at m.v. light on 18.vii.1988 at Halton, Leeds. Although taken previously in Nottinghamshire, this appears to be the first record for Yorkshire. Andrew also took three specimens, including one melanic, of the Buff Ermine, *Eilema deplana* Esp. at light on 24.vii.1988 at Bishops Wood — the only other record this century being one taken by Barry Spence at Spurn in 1984. A specimen of the Scallop Shell, *Rheumaptera undulata* L., which is rare in Yorkshire, was also taken in Bishops Wood on 24.vii.1988.

A second species new to Yorkshire was the Twin-spotted Wainscot, *Archanara geminipuncta* Haw., taken at light at Spurn by Barry Spence on 8.ix.88. A single specimen of the Waved Black, *Parascotia fuliginosa* L. was taken by day on Skipwith Common by Messrs. Higginbottom and Ezard. The only previous Yorkshire record in the last 50 years is for one at Spurn, 23.vii.1982. — S.M. JACKSON, 31 Hillfield, Selby, North Yorkshire YO8 0ND.

BROWNE *versus* WATSON: ROUND TWO

RAYMOND R. UHTHOFF-KAUFMANN

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NEARLY sixty years ago the late Professor F.Balfour-Browne wrote a long paper, following various extensive deliberations of a committee of which he was secretary, advocating the use of double alphabetical symbols to denote the counties and vice-counties of the British Isles so as to replace, or at least to reinforce the use of the Watsonian system of numbering the counties and their sub-divisions — the latter system has some faults still unrectified. The committee's findings were never finally endorsed; as a result many of our entomologists abide by the numerical lists; others use the two-letter symbols which are in almost every case *aides-mémoires* and less taxing. To give a very recent example: perusal of several pages of details from the Scottish National Indices in which Watsonian figures are in use elicited a bibliographical reference and the number 84. This was thought first to stand for its Brownean equivalent LL (Linlithgow); further investigation, however, revealed that the numeral referred to the pagination in Murray's 1853 *Catalogue of the Coleoptera of Scotland*. So much for Watsoniana!

Quite apart from a muddle which occurred when the Irish numbering was added to the Watsonian system, which has led to all the Irish counties' numbers being prefixed by the letter H, thus, H1 = South Kerry, there is no provision for the (former) County of London nor for Lundy Island which has a small but important entomological fauna: both are covered by Brownean lettering. A baker's dozen double letters are duplicated, such as, WC (West Cornwall) and WC (West Cork); they are easily distinguished by adding (E) or (Engl.) and (I) or (Irel.) respectively.

Granted, a very few changes might be helpful: King's Co. and Queen's Co. in Ireland are now re-named Offaly and Leix and could be labelled, say OF and LX; Browne's Cantire (CT) (= Kintyre) would be more usefully expressed as KT.

Professor Browne's plea may have fallen on many deaf ears; nevertheless, how would Watson, Praeger and the other numerologists involved have assessed the identity of that afterthought lb? And how does one deal with, for instance, Hundred House, in the Administrative Area of Powys, which covers three Welsh counties?

One final comment: compare Balfour-Browne's ingenious typomap (fig.1) with the difficulty in finding the Watsonian 99 on a map of similar proportions.

Below is the explanatory list in alphabetical order of the counties and vice-counties with their Brownean lettering and Watsonian numerical equivalents.

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                              SI
                          OI
                      NS  CA
            HB        SS
                  RW· RE  EL  BF  AN
              S
                  WI  EI  PN  AS
                  AM  PM  FF  KI
              M
                  DN  SG  PC  KF
             I    B
              CT      RF  LL  ED  HD
                      AY  LA  PE  BW  NN
   WD  ED  LD  AN    WT  KB  DF  SK  RX  SN
       FE  TY  AR  DO            CU  WL  NY  DM
                         IM
WM SL  LE  MO                        ML  MY  EY
   EM  RO  CV  LH                    SL  WY  SY  LN
                         A
WG NG  LF  WH  ME        CR  DB  FT  CH  DY  NM  LS
   SG  KC  KD  DU            MN  MG  SP  ST  LR  CB  WN  EN
CL NT  QC  CW  WI            CD  RA  HF  WO  WW  NO  HU  WS ES
NK LK  ST  KK  WX        PB  CM  BR  GE  OX  BX  BD  HT  NE
SK MC  EC  WA                GM  MM  GW  NW  BK  MX  SE
                                                  I
   WC                                NS  SW  NH  SR  WK  EK
                             L
                                 ND  SS  DT  SH  WX  EX
                             EC  SD          IW
                     SG  WC
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Fig.1. 'Typomap' of the British Isles. From Balfour-Browne (1931).

ENGLAND

Beds., BD = 30, Berks., BK = 22, Bucks., BX = 24, Cambridge, CB = 29, Cheshire, CH = 58, Cornwall, East, EC = 2, Cornwall, West, WC = 1, Cumberland, CU = 70, Derby, DY = 57, Devon, North, ND = 4, Devon, South, SD = 3, Dorset, DT = 9, Durham, DM = 66, Essex, North, NE = 19, Essex, South, SE = 18, Glos., East, GE = 33, Glos., West, GW = 34, Hants., North, NH = 12, Hants., South, SH = 11, Hereford, HF = 36, Herts., HT = 20, Hunts., HU = 31, Kent, East, EK = 15, Kent, West, WK = 16, Lancs., Mid (or West), ML = 60, Lancs., South, SL = 59, Leics. with Rutland, LR = 55 and 55b, Lincs., North, LN = 54, Lincs., South, LS = 53, London (Cty.), L = -, Mddx., MX = 21, Monmouth, MM = 35, Norfolk, West, WN = 28, Norfolk, East, EN = 27, Northants., NO = 22, Northumberland, North,

NN = 68, Northumberland, South, SN = 67, Notts., NM = 56, Oxford, OX = 23, Rutland (see Leics.), Salop, SP = 40, Somerset, North, NS = 6, Somerset, South, SS = 5, Staffs., ST = 39, Suffolk, West, WS = 26, Suffolk, East, ES = 25, Surrey, SR = 17, Sussex, East, EX = 14, Sussex, West, WX = 13, Warwick, WW = 38, Westmorland and Lancs., North, WL = 69 and 69b, Wilts., North, NW = 7, Wilts., South, SW = 8, Worcs., WO = 37, Yorks., North-west, NY = 65, Yorks., Mid-west, MY = 64, Yorks., North-east, EY = 62, Yorks., South-west, WY = 63, Yorks., South-east, SY = 61, I. of Man, IM = 70, I. of Wight, IW = 10, Lundy Is., l = -, Scilly Is., SC = lb.

WALES

Anglesey, A = 52, Brecon, BR = 42, Cardigan, CD = 46, Carmarthen, CM = 44, Carnarvon, CR = 49, Denbigh, DB = 50, Flint, FT = 51, Glam., GM = 41, Merioneth, MN = 48, Montgomery, MG = 47, Pembroke, PB = 45, Radnor, RA = 43.

SCOTLAND

Aberdeen, North, AN = 93, Aberdeen, South, AS = 92, Argyle, Main, AM = 98, Ayr, AY = 75, Banff, BF = 94, Berwick, BW = 81, Caithness, CA = 109, Cantire (Kintyre), CT = 101, Clackmannan, see Perth, South, Cromarty, see Ross, Dunbarton, DN = 99, Dumfries, DF = 72, Edinburgh (Mid-Lothian), ED = 83, Elgin (Moray), EL = 95, Fife, see Kinross, Forfar (Angus), FF = 90, Haddington (East-Lothian), HD = 82, Inverness, East (Easterness), EI = 96 and 96b, Inverness, West (Westerness), WI = 97, Kincardine, KI = 91, Kinross + Fife, KF = 85, Kirkcudbright, KB = 73, Lanark, LA = 77, Linlithgow (West-Lothian), LL = 84, Nairn, see East Inverness, Orkneys, OI = 111, Peebles, PE = 78, Perth, North (or East), PN = 89, Perth, Mid, PM = 88, Perth, South (or West) + Clackmannan, PC = 87, Renfrew, RF = 76, Ross with Cromarty, East, RE = 106, Ross with Cromarty, West, RW = 105, Roxburgh, RX = 80, Selkirk, SK = 79, Shetlands, SI = 112, Stirling, SC = 86, Sutherland, North (or West), NS = 108, Sutherland, South (or East), SS = 107, Wigton, WT = 74, Hebrides, Outer, HB = 110, Bute and Clyde Is., B = 100, Islay etc. (Ebudes, South), I = 102, Mull etc. (Ebudes, Mid), M = 103, Skye etc. (Ebudes, North), S = 104.

IRELAND

Antrim, AN = H39, Armagh, AR = H37, Carlow, CW = H13, Cavan, CV = H30, Clare, CL = H9, Cork, East, EC = H5, Cork, Mid, MC = H4, Cork, West, WC = H3, Donegal, East, ED = H34, Donegal, West, WD = H35, Down, DO = H38, Dublin, DU = H21, Fermanagh, FE = H33, Galway, West, WG = H16, Galway, North, NG = H17, Galway, South, SG = H15, Kerry, North, NK = H2, Kerry, South, SK = H1, Kildare, KD = H19, Kilkenny, KK = H11, King's Cty. (Offaly), KC = H18, Leitrim, LE = H29, Limerick, LK = H8, Londonderry, LD = H40, Longford, LF = H24, Louth, LH = H21, Mayo, East, EM = H26, Mayo, West, WM = H27, Meath, ME = H22, Monaghan, MO = H32, Queen's Cty. (Leix, Laois), QC = H14, Roscommon, RO = H25, Sligo, SL = H28, Tipperary, North, NT = H10, Tipperary, South, ST = H7, Tyrone, TY = H36, Waterford, WA = H6, Westmeath, WH = H23, Wexford, WX = H12, Wicklow, WI = H20.

Acknowledgement

Figure 1 is reproduced with the permission of the Editor, *Entomologist's Monthly Magazine*, Published by Gem Publishing Company.

Reference

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Caloptilia falconipennella (Hübn.) and _C. populetorum_ (Zell.) (Lep.: Gracillariidae) in Kent.

During August 1988 I collected a number of *Caloptilia* cones from alder in Petts Wood, north-west Kent, in order to breed *C. elongella* L. To my surprise and delight the first moth to emerge on 19th September was *C. falconipennella.* I immediately had a closer look at the material I had collected and found a further five of the characteristic cocoons of *falconipennella* under turned-over leaf edges. In my ignorance I had assumed, at the time of collecting, that these were the early cones of *elongella.* Unfortunately, three of the cocoons produced parasites and the remaining two failed to produce anything. On opening the cocoons several weeks later I found two dead pupae. I understand that *falconipennella* is not easy to rear, but I am puzzled as to why the two pupae failed to emerge. As *falconipennella* is not recorded from Kent in Heath and Emmet (1985), *Moths and Butterflies of Great Britain and Ireland*, volume two, I think it is probably a first County record, and also, of course, for v.c.15.

I was also fortunate to take a specimen of *C. populetorum* at light in my garden (which backs on to Petts Wood) on 27 November 1987 but failed to find larvae or cones in July 1988. However, a second, fresh specimen came to light on 20th July 1988 and another on 23rd July, which seems to confirm that *populetorum* is at least partially double-brooded even in a cool summer such as 1988. *C. populetorum* is, I gather, a very rare moth in Kent and these records are therefore of note. — D. O'KEEFFE, 50 Hazelmere Road, Petts Wood, Kent BR5 1PD.

Colostygia multistrigaria Haw., the Mottled Grey (Lep.: Geometridae), in mid-winter.

Whilst collecting at Kynance Cove, West Cornwall, on the night of 31st December 1988, I was surprised to find this geometer on the wing and at rest in some numbers.

Two pairs were found in copulation, with several other females at rest elsewhere. Males intermittently approached my Tilley lamp during the period between 1800 and 2300 hours. Most were fresh, however a few were apparently a few days old. Altogether, I must have seen some 20 moths.

Scouring my own records for this species, the earliest date I have is 1st March 1975, at Bedgebury, Kent. The exceptionally mild December, with light to moderate, warm south-westerly winds coupled with relatively dry conditions, appears to have prompted this moth to emerge at a most unusual time of year in this part of the country.

It is also worth noting that two larvae of the Fox Moth, *Macrothylacia rubi* L. were also found, and that a few larvae of *Xestia xanthographa* D. & S., the Square-spot Rustic, were well into the last instar at this location. — J. PLATTS, 11 Maydowns Road, Chestfield, Whitstable, Kent.

CHLOROCLYSTIS RECTANGULATA L. (LEP.: GEOMETRIDAE) AB. *PILCHERI* Ab.Nov.

G.M. Haggett

Meadows End, Northacre Caston, Attleborough, Norfolk.

ON 30th June 1987 a male aberration of *Chloroclystis rectangulata* was found dead by Mr John Jaines outside the window of a cottage in Mucton, Lincolnshire. The moth had suffered a split in the wings and damage to its fringes, but otherwise the wings appear to be perfect, and thus this remarkable aberration cannot be ascribed to wear or damage.

All four wings with the median space, which in a typical *rectangulata* is filled with black shading and wriggling transverse lines, a pale dusky cream colour with the veins and costa paler, the veins appearing as pale fine rays. The only marking within this broad space on each wing is the blackish and very prominent discal spot. This broad pale band of each wing is bounded abruptly by the continuous deep black scalloped post median line. The outer margin of all four wings is heavily darkened and the submarginal black clouding of typical *rectangulata* is much intensified.

The moth was taken to Mr R.E.M. Pilcher, for many years Consultant Surgeon to Boston Hospital, and who so retains his surgical skills that he performed the remarkable operation of restoring this dried corpse. It is in recognition of his long years as naturalist, ornithologist and lepidopterist that I am pleased to name this aberration.

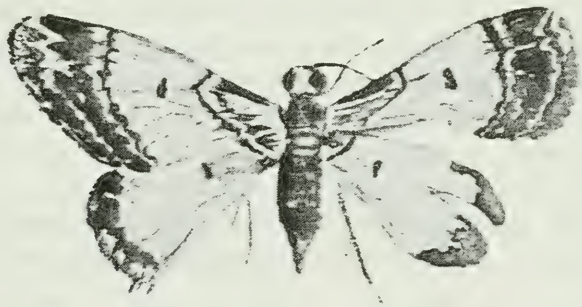

Fig.1 *Chloroclystis rectangulata* Linn. ab. pilcheri ab. nov. (× 2.6)

Heliothis armigera **(Hübner) (Lep.: Noctuidae) in Hampshire and Leicestershire.**

A scarce bordered straw, *Heliothis armigera*, was caught in an m.v. trap in the garden at Burnt Mill House, Romsey, Hampshire, on 19 October 1988, and another, also in an m.v. trap, in the garden at 66 Scraptoft Lane, Leicester, on 26 October 1988. Both specimens are slightly worn, and certainly not freshly emerged, suggesting recent immigration. The capture of two individuals in a week at two widely separated localities suggests a more general occurrence of this normally infrequent immigrant. — DENIS F. OWEN, 2 Shelford Place, Headington, Oxford.

Xanthia citrago **L. (Lep.: Noctuidae) — aberrant behaviour of larvae?**

Late at night on 1 June 1988, I beat some noctuid larvae from lime trees at Kingussie, Inverness-shire and Aberfeldy, Perthshire, which I presumed were *citrago*. Now a characteristic of British sallow larvae is that upon becoming full-grown they undergo a long resting period lasting a number of weeks before pupating, and I can confirm that this is so with Kentish *X. icteritia* Hufn. C. Barrett (*Lepidoptera of the British Islands*, 1899) states that the pupal stage of *citrago* is not attained until the larva has remained in the cocoon from five to seven weeks, while L.W. Newman and Leeds (*Textbook of British Butterflies and Moths*, 1909) state that the larva goes into a cocoon in May and does not change to a pupa until August.

The larvae I brought back from Scotland were being kept in a newspaper lined plastic container prior to transfer to more suitable accommodation when on 5th June I noticed one larva was preparing for pupation between the transparent side of the container and some loose paper, in a retreat not meriting the term cocoon. By the 9th it had changed to a pupa, and several days later I decided to see what was happening to the other larvae; three more pupae were revealed lying in slight cavities beneath the dying lime leaves. A fine series of *X. citrago* emerged in late July, a not unduly early time of emergence for this species in captivity indoors.

I wonder if this behaviour of the larvae is not unusual under these artificial conditions, or is it a peculiarity confined to the Scottish Highland population?

I have not seen it mentioned in the textbooks that *citrago* from the Highlands of Scotland are quite unlike normal specimens from southern England in that the central transverse dark line of the forewing is wider and more pronounced — ab. *umbrata* Heinrich. Also these Highland specimens tend to have considerable dark shading within the reniform stigma, giving the appearance of a dark blotch on the outer aspect of the central dark line; my Kentish specimens do not display this feature. These characters and the uniformly large size of these Scottish specimens make them quite distinct, at least from those from Kent. — B.K. WEST, 36 Briar Road, Dartford, Kent.

A VERY RARE BEETLE REDISCOVERED IN SURREY

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THOUGH it is known to have been with us for at least the better part of a century, *Ernobius angusticollis* (Ratz.) remains one of the very rarest and least known of British Anobiidae. As far as published records go, the position has not changed since Mr Colin Johnson's excellent revision of the north European species of the genus appeared in 1966; however, two additional occurrences have come to our notice and are recorded below. Encouraged by these and the information we were able to gather on the two Surrey captures, the writers have in the last few seasons made repeated efforts to find the beetle, which this year (1988) finally bore fruit.

The past records are of three specimens only, at rather long intervals and each from a different county. They are given by Johnson (1966) and repeated here with a few further details:—

(1) Near Mildenhall, Suffolk, a male on a "peculiar" conifer hedge, 6.vi.1899 (D. Sharp, 1916); in his paper bringing forward this and other species as British, Dr Sharp mentions the locality as near the road from Barton Mills to Brandon. (2) A male in coll. P. Harwood with label "?? bred from spruce cones collected near Blandford (Dorset) by S.C.S. Brown" and written behind the card "Bournemouth 24.v.45". In view of the double query Johnson (1966:87), with reason, gave the locality as Bournemouth, but what is now known of the bionomics of the species justifies us in regarding Blandford as the more likely place of origin — the insect doubtless emerging at Bournemouth where Harwood was then living. (3) Banstead, Surrey, 21.v.1952, a female (P.D. Orton) — see further below.

A few years ago we were shown by Mr Norman Heal a pair of *Ernobius* which had emerged (23.v.85) from fallen Scots pine cones gathered at Horsell Common, Surrey, and which were later confirmed as *E. angusticollis*. In an attempt to follow up this capture, the writers collected a very large number of pine cones from the same place in the spring of the next two years, including not only fallen but also green ones still on the trees, but to no avail. More recently Dr Paul Hyman showed us an example of this beetle taken by the late W.O. Steel in Windsor Forest, Berks, 7.vii.1960; thus bringing the localities where the species has been found up to five (four counties).

By a lucky chance, Mr Peter Orton happened to be on a visit to Epsom last August and, learning of our interest in his Banstead capture, was eventually able to remember and to point out just where he had taken the beetle 36 years ago. It was swept at the edge of Nork Wood, a plantation

containing many mature trees of Norway spruce (*Picea abies*) and larch, etc, and which very fortunately still exists. Having noticed from the records that the peak time for the species seemed to be the last week of May, the writers visited the wood on 24.v.88 — after a failed attempt to breed the *Ernobius* from spruce cones gathered there the previous winter. Very many of the trees had fallen victim to the great October hurricane, but this circumstance was to stand us in good stead by bringing the tops of the spruces, with their clusters of cones, within easy reach. It was now that perseverance reaped its reward; from one cone-bearing spruce top on the fringe of the wood, two *E. angusticollis* were beaten within a few minutes of our arrival. An hour or more was spent exploring the interior of the wood, and many spruce tops were vainly beaten. At length, however, one was found (oddly enough with only one cone visible) which yielded several specimens including both sexes. It thus appears that the beetle is not only rare but also exceedingly local in Nork Wood, though of course far more work would have to be done there before its true status at this site could be determined.

On the Continent *Ernobius angusticollis* is everywhere uncommon or scarce, but widespread in at least Denmark and Germany. The Scandinavian authors record it from pines and firs in general and as having been bred from spruce cones like certain others of the genus. Pine cones, however, are apparently not mentioned in this connection, which makes Mr Heal's experience noteworthy and possibly exceptional. The area from which he collected the cones is unmixed pinewood, and the writers, at least, have seen no spruce there, the nearest being isolated trees in gardens near the common and hardly likely to have been the source of the two bred specimens. One wonders whether this *Ernobius* could have been present in the formerly extensive pinewoods of the Woking area (of which Horsell Common forms part) when G.C. Champion worked them so assiduously early in the century; at all events, he did not find it. There seems, thus far, to be no evidence that *E. angusticollis* is attracted to young burnt pines as are the other British species, though that may be due simply to its rarity or a high degree of attachment to spruce.

Acknowledgements

We are very grateful to Mr P.D. Orton for information leading to the rediscovery of the species at the Banstead locality; and to Mr N.F. Heal and Dr P.S. Hyman for letting us see their specimens and for permission to publish their records.

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SURVEY OF PARASITOIDS OF BRITISH BUTTERFLIES

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BUTTERFLIES are the most familiar of British insects, popular with both entomologists and the general public, and there has been a long history of collecting and observing them in Britain. Until comparatively recently many species occurred in large numbers in suitable places and, over the years, literally millions must have been collected from the British countryside. Not suprisingly, almost all have been taken as adults: in contrast with many other Lepidoptera, butterflies are much easier to find as adults than earlier in their lives. Although most of us see the same half dozen species as caterpillars year after year, the majority are rarely encountered and only two or three are at all easy to find as pupae. Why bother to look for early stages when the adults are so conspicuous?

One good reason is that so little is known about their parasitoids: much less than for most other groups of Lepidoptera in which collecting activity has traditionally included searching for early stages (and micro-lepidopterists, in particular, still depend less on m.v. light than muddy knees). In fact the lack of information on parasitism of butterfly larvae and pupae is quite remarkable: a preliminary survey that we have carried out has revealed no British records of parasitoids of 20 out of the 58 species that are permanently resident or regularly breed in Britain, and only very sketchy or unverifiable information concerning most of the rest. Only about a dozen species have been collected as larvae regularly enough for some of their parasitoids to be well known but, even then, there is usually much less information on parasitism of the egg or pupal stages, each of which is susceptible to attack from various groups of parasitoids quite different from those that develop in or on larvae. The most important groups of parasitoids that attack butterfly larvae are in the families Ichneumonidae, Braconidae and Tachinidae. Pupae are sought by a few groups of Ichneumonidae and Chalcidoidea (mostly Pteromalidae), while eggs are attacked principally be Scelionidae and Trichogrammatidae. Except for the Tachinidae, which are Diptera, all of these groups belong to the Order Hymenoptera.

In recent years the conservation of British butterflies has become a concern, and detailed ecological appraisals of several species have been carried out. Parasitism has generally been regarded as of little importance in the population dynamics of most of the species studied in comparison with other stresses (Dempster, 1983, 1984), although the basis of this view has been questioned (Hassell, 1985; see also Murdoch & Reeve, 1987) and the sites chosen for ecological studies have sometimes been wildly atypical (Shaw, 1981). Whether or not parasitoids are important regulators of

butterfly populations is in any case only a part of the conservation issue. The parasitoids themselves are worthy of attention and concern from conservationists, because there is no doubt that a high proportion of the species associated with butterflies are very specialised and completely dependent on one or a few species of butterfly for their continued existence in Britain (eg Ford, 1976; Shaw, 1978, 1981). Others may be less specialised and simply include species of butterfly in host ranges that encompass a wider span of Lepidoptera (eg some Tachinidae, and certain *Pimpla* and *Apechthis* species: see host ranges expressed in van Emden, 1954 and Fitton et al, 1988 respectively).

With a view to sharpening this parasitoid-orientated focus, we have started a long term project to accumulate reliable information on the species attacking British butterflies. One eventual aim is to provide keys to the parasitoids concerned and a summary of host range for each species. In order to do this reliably, however, we must depend only on the first hand evidence of reared specimens that are available for us to examine ourselves (for a fuller discussion on this need see Shaw, in press). We are embarking on a search for reared specimens in the collections at our disposal, but for the project to be successful we need also to ask all lepidopterists to pass on to us parasitoids reared from eggs, larvae and pupae of British (or European) butterflies. As much material as possible is wanted: parasitoids reared from species that are infrequently collected in the wild will obviously be especially valuable, but even the more accessible species will yield important data. Some frequent associations well known to us, but which are insufficiently represented in collections or need to be investigated further, include: (a) killing larvae of *Gonepteryx rhamni* (L.), solitary, making a grey and black blotched or banded cocoon within the host's larval skin = *Hyposoter ebeninus* (Gravenhost); (b) killing larvae of *G. rhamni*, solitary, making a small golden-yellow tufted cocoon = *Apanteles* (s. lato) *gonopterygis* Marshall; (c) a solitary black and yellow ichneumonid emerging from pupae of *Celastrina argiolus* (L.) = *Listrodromus nycthemerus* (Gravenhorst); and (d) killing larvae of *Aglais urticae* (L.) or *Inachis io* (L.), solitary, making an ovoid grey-brown smooth cocoon free from the substrate (sometimes twitching or jumping) = *Phobocampe confusa* (Thomson). However, in order to save correspondents unnecessary trouble, we can also mention some of the commonest, very regular associations that, if they occur ***exactly*** as below, we do not need to see again. These are: (a) killing larvae of *Pieris brassicae* (L.) or *P. rapae* (L.), making small gregarious yellow cocoons = *Apanteles* (s. lato) *glomeratus* (L.); (b) gregarious metallic green-bronze chalcids emerging from pupae of *P. brassicae* or *P. rapae* collected from suburban situations = *Pteromalus puparum* (L.); and (c) killing larvae of *Vanessa atalanta* (L.), making medium sized white gregarious cocoons in broods of 4-15 = *Microgaster subcompletus* Nees. Any deviation (including brood

sizes) from the above exact circumstances may well represent different species that we would like to see: if in doubt, please send it!

Please send all reared specimens that you can spare to Dr Mark R. Shaw, National Musems of Scotland, Chambers Street, Edinburgh EH1 1JF. They should preferably be sent dry, unmounted but loosely wedged (eg with cotton wool in tubes) so that they do not rattle and break in the post, and need to be very well packed to survive transit. All cocoons and host remains etc should be sent (wedged or in some other way separated from the adults, which they may otherwise damage in transit). Care has to be taken to guard against mould etc — let it all dry out before sending it and avoid small fully airtight containers. Data should include host name, place and if possible foodplant from which collected, and dates of collection and emergence (if only one date is available, say which it is! Approximate dates — even "Spring" — are still useful). ***Always emphasise all doubt clearly.*** More detailed notes on rearing and preserving parasitoids of Lepidoptera are available from either of us on request. Thank you!

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White metathoracic crests in *Eupithecia lariciata* Freyer and *E. tripunctaria* Herrich-Schäffer (Lep.: Geometridae), the Larch and White-spotted Pugs.

Meyrick (1927, *Revised Handbook of British Lepidoptera,* Watkins and Doncaster, p. 224) states, under the description of *Eupithecia albipunctata* Haworth (= *tripunctaria* H.-S.), that this species has a white thoracic spot. This spot is not mentioned in the description of *E. lariciata* and is not used in the dichotomous key for either species.

Most modern popular works, including the British Entomological and Natural History Society's publication exclusively concerning the Pugs (*Identification Guide to the British Pugs*, BENHS, 1981), cite the white metathoracic crest as being a diagnostic feature of *E. lariciata.* This is very misleading as, having examined many specimens from Rothamsted Insect Survey light trap catches, my own collection and the national collection at the British Museum (Natural History), I can confirm that the white metathoracic crest is present in both species. Contrary to what is often suggested, it is therefore unwise to assume that all Pugs bearing this crest are *E. lariciata.*

Although both species fly at the same time of year (May to September, though *E. lariciata* is only recorded sporadically later than June (Riley, 1986, *Ent. Rec.* **98**: 207-208 and Riley, 1987, *Ent. Rec.* **99**: 152)) there is little chance of confusing fresh specimens of the typical forms: *E. tripunctaria* is immediately distinguishable by the conspicuous white tornal spots on both fore and hind wings. However, worn specimens can be difficult to separate and examination of the male abdominal plates or the genitalia is necessary. The metathoracic crest may also be present in both the melanic forms *E. lariciata* ab. *nigra* Prout and *E. tripunctaria* ab. *angelicata* Barrett but it is usually inconspicuous. In *E. tripunctaria* ab. *angelicata* the typical white tornal spots are absent and hence it is often superficially inseparable from *E. lariciata* ab. *nigra.* In such cases the abdominal plates or the genitalia should always be examined. — ADRIAN M. RILEY, Entomology and Nematology Department, Rothamsted Experimental Station, Harpenden, Herts AL5 2JQ.

***Bryaxis puncticollis* Denny (Col.: Pselaphidae) apparently new to Kent.**

Very strangely there seems to be no Kent Record, or rather none that I have seen, of this local but not particularly rare beetle; even the old records from near London are all for Surrey localities. It may therefore be worth reporting the capture of a single male of the form *validus* Aubé (with thickened femora) in damp dead leaves in Oxleas Wood, Shooters Hill, near here, 5.ix.86. I had previously found the species in Windsor Forest and more freely at Esher, Surrey, in wet moss. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

MOSQUITOES AND THEIR IMPORTANCE AS VECTORS OF DISEASE ORGANISMS IN SOUTHERN AFTICA

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MOST people think of mosquitoes as just biting pests and are generally disliked because they transmit organisms which cause diseases such as malaria and yellow fever. This is true for some species but the vast majority are actually perfectly harmless to man. In Southern Africa of the approximately 220 species, only about 20 have been implicated in disease transmission. Mosquitoes in fact are extremely interesting, and an important part of the environment and in the following paper I provide a brief introduction to their biology.

The family Culicidae or mosquitoes are divided into three subfamilies: Anophelinae, Toxorhynchitinae and Culicinae, all three of which are represented in Southern Africa. Members of the Anophelinae are important as vectors of malaria parasites. The Culicinae are involved in the transmitting of various virus diseases to man and animals. The adults of both sexes of the Toxorhynchitinae are flower-feeders only, and therefore are not involved in the transmission of pathogens. Members of the Toxorhynchitinae have also been considered as agents for the biological control of biting and disease-carrying mosquitoes because of the predatory behaviour of their larvae.

Mosquitoes, as do most other flies, pass through seven stages during their life cycle: the egg, the four successively larger larval instars, the pupa and the adult.

Depending on the species to which they belong, eggs are laid either singly on water or glued together in rafts or on moist soil at the edge of the water or in moist depressions. The eggs of *Anopheles* have lateral structures that keep them afloat. The incubation period is short in warm weather (usually two or three days), but in certain species, particularly *Aedes*, the eggs are able to withstand long periods of drying; in fact, they appear to require a certain amount of drying before they will hatch.

Embryonic development begins immediately after oviposition in all species, but in the case of the floodwater mosquitoes, hatching does not take place until an adequately long period of dryness has passed. Eggs that have ceased development during adverse conditions of drought or cold are said to be in diapause. Eggs of tree-hole breeding species are stimulated to hatch by decreasing oxygen tension as bacteria begin to multiply around them.

The larvae of all mosquitoes are aquatic and most of them free swimming. During the period of development, which lasts four to ten or more days, the larval skin is shed four times, each successive instar showing a progressive increase in size. The first instar is usually 1-2mm long, but it

may by 4mm in the largest species. It is always recognisable by its egg burster, a pointed conical protuberance on the top of its head. In the third instar, the hairs have fewer branches than in the fourth instar, and the sclerotization of the anal segment is less compete. Immature *Anopheles* larvae usually have a collar of dark sclerotin around the base of the head. The fourth, or last, larval instar is 3-15mm long. Except for the predatory species all larval instars feed on detritus, algae, and other micro-organisms, which they strain out of the water.The larvae of some species feed mainly at or near the surface, whereas others feed mainly at or near the bottom, although most species are adaptable enough to feed wherever food is plentiful. Thus *Anopheles* larvae which are highly adapted for surface feeding, take food from the bottom when necessary. Low-protein diets produce stunted adults, whereas high-protein diets tend to produce larger and longer-lived adults. However, no diets have been discovered that produce adults appreciably larger than those that develop under natural conditions.

The mouthparts of mosquito larvae are among the most elaborately evolved of any insect mouthparts. Food particles are gathered by a pair of labral brushes on either side of the mouth, each of which is a large bundle of long curved hairs arranged in closely packed rows on the underside of the labrum. The labral brushes open by internal blood pressure and are closed by two pairs of large muscles. The brushes open and close rapidly, several times per second, and this motion generates a current of water that helps to bring more particles into range and may also move the larva slowly over the substrate. At each closing of the brushes, food particles that have become entrapped by the hairs are combed out by a row of stiff parallel hairs along the curved dorsal edge of each mandible. As the mandible opens, particles are combed from it by backwardly projecting hairs on the midventral region of the labrum, assisted by the maxillae. Finally, a bundle of hairs at the base of the mandible scrapes the food from the midventral labral region into the pharynx. This complex manoeuvre, in which the mandible plays a dual role by merely opening and closing, is not restricted to mosquitoes but is characteristic of the larvae of other related families, for example the black flies (Simuliidae). If particles are too large to be handled in the previously described manner, they may be rasped into smaller pieces by the labral brushes, whose apices are often saw-toothed. Particles may also be broken up between the sharp tips of the mandibles and the hypostomial teeth.

Some larvae are predaceous on active invertebrates, including other mosquito larvae. For example, all stages of *Toxorhynchites* larvae prey on invertebrates, generally of their same size or smaller in container habitats. The most common natural container habitats are tree holes and bamboo. Since other mosquito larvae are usually the most common arthropods present, they are presumed to be their chief prey. However, numerous examples of other prey have been reported, including larvae of

Chironomidae and Tipulidae, small tadpoles, small nymphs of dragonflies, and syrphid larvae. The predatory behaviour of *Toxorhynchites* larvae is basically opportunistic. They do not search for prey; instead they ambush prey as it comes within their range, probably using mechanoreceptors. The developing compound eye of *Toxorhynchites* is not functional as a visual organ in the development period except in the late pupal stage. The larvae normally rest on the surface at an angle of about 45° (earlier instars rest almost horizontally, resembling *Anopheles*). In smaller containers, larvae tend to rest at the edge of the water facing the centre. When ready to feed, the angle of the body moves to a more horizontal position. When the prey approaches within striking distance, the predator strikes laterally and grasps the prey with the mandibles. The modified prehensile mouth brushes are apparently essential to the proper functioning of the mandibles. Capture of the prey can occur either on the surface or at the bottom of the container. The prey is generally consumed within minutes.

Feeding behaviour can be adjusted in response to low prey densities. Fourth instar larvae of *Toxorhynchites brevipalpis* Theobald slow their metabolism and feeding in response to food scarcity. It has also been shown that after a period of starvation, fourth-instar larvae resumed feeding at an initially low rate. *Toxorhynchites* larvae are cannibalistic in all instars and will even feed on their fellows in the presence of other prey.

Resistance to starvation and to partial dessication are favourable attributes for predators that depend upon a capricious prey supply in habitats subject to water loss. Resistance to starvation has been demonstrated for a number of *Toxorhynchites*. The fourth instar larva is the most resistant stage. Fourth instar *T. brevipalpis* have been kept out or water in a damp atmosphere for three to four weeks without food; they developed normally when returned to water with a supply of prey. Another fourth instar larva was held in a small vial with sludge from the bottom of a tree hole for ten weeks. The sludge gradually formed a firm cake 12mm thick. The larva survived in a crack in the sludge, where it noticably shrunk in size. After ten weeks, water and prey were added and the larva developed normally. The ability of mature larvae to withstand withdrawal of both food and water for extended periods of time undoubtedly permits *Toxorhynchites* to exist through long dry spells.

Larvae have no legs, or pseudopods, but they swim by lashing the abdomen from side to side, a movement from which their common name of "wrigglers" was derived. The ventral brush, a dense row of long stiff hairs well braced at their bases to prevent them bending from side to side, serves as a paddle. The long hairs of the body, which are so useful taxonomically, may also be sensory in function. Although respiration in minute larvae is mainly through the skin, older larvae of all species respire through a pair of openings or spiracles, on the dorsum of abdominal segment viii. In the subfamily Anophelinae the spiracles are flush with the

surface, but in all other mosquitoes they are elevated at the apex of a conical siphon. The body of the larva is slightly heavier than water so that it sinks slowly towards the bottom and the larva must jerk its abdomen from side to side to rise. It can hang suspended from the surface film by opening the little pointed plates (valves) at the tip of its siphon which forms a tiny star but which close over the spiracles when the larva sinks. Anopheline larvae have star-shaped hairs along the back which also serve to hold them up when resting at the surface. Culicine larvae always rest at the surface with the body hanging down at an angle but Anopheline larvae rest parallel with the surface. One of the oldest control methods still widely used is to disrupt the surface tension with an oily substance in an attempt to asphyxiate the larvae.

The larvae of the genera *Mansonia* and *Coquillettidia* differ from those of other Southern African species by their siphons which are highly modified for piercing plant-tissues. The siphon is very short and the anterior valves are small and each bears a stout curved bristle, while the posterior pair are greatly enlarged (as long as the siphon itself), and fused together to form a sheath for a complicated internal apparatus which includes a strongly sclerotized saw. The larvae are all very sluggish, and swim with a peculiar slow wriggling motion. Their habit of attaching themselves by means of the valves of the siphon to the stems or leaves of aquatic plants and obtaining oxygen from the tissues of the plants is well known. Although thus dependent on plants for oxygen, they are, in emergency, capable of breathing air from the surface like other mosquito larvae, but only do this when disturbed and unable at once to obtain a new siphon hold.

Osmoregulation takes place in the rectal wall in two pairs of conical anal papillae that project from it. These papillae have often been referred to as "gills", but they apparently have no respiratory function. The papillae are greatly reduced in size in all the species living in water that has a high content of dissolved salts, such as coastal salt marshes or inland salt pans.

After the fourth moult the larva changes into a comma-shaped pupa. The "head" of the pupa is really the combined head and thorax and the curved portion is the abdomen. Unlike the larva, the pupa is lighter than water and rises to the surface as soon as it stops swimming. Instead of having spiracles at the hind end of the abdomen at the tip of a respiratory siphon, the pupa has two breathing trumpets on the back of its thorax, so that as it rises to the surface, these automatically pierce the surface film and the little creature can breathe. The breathing trumpets of Culicine pupae are usually long and narrow from the side view, while those of Anopheline pupae are short and broad. The trumpets of the genera *Mansonia* and *Coquillettidia*, as in the larva, are modified to be inserted into the rootlets of aquatic plants from which the pupa derives its air supply.

The pupae of most insects are inactive but mosquito pupae can swim rapidly downward and backward, as does a lobster, by scooping water with

a pair of paddle-like flanges at the tip of its abdomen. Unless it can anchor itself on the bottom beneath or among vegetation, it gradually bobs to the surface again. When at rest, the pupae remain motionless, floating at the surface. By this behaviour, the pupae of mosquitoes can be distinguished from most of the pupae of Chironomidae and Chaeboridae, which resemble those of mosquitoes but remain suspended below the surface until the adult is about to emerge.

The pupal stage may last only a few hours in the case of those species that breed in rain pools liable to dry up quickly, while in other cases it may last two days to a week or more. As in most other aquatic Diptera, the adults emerge rapidly from the floating pupae through a longitudinal slit in the back of the thorax into the air. The surface tension of the water prevents the adult from getting wet as it rests on the surface before flying off.

Fig. 1. *Aedes (Steggomyia) aegypti* female, a cosmopolitan tree-hole breeding species.

The adult mosquito, especially the female, needs no introduction. No other fly has a long slender densely scaled proboscis as long as the thorax, long slender 15-segmented antennae and densely scaled wing veins. The female's proboscis consists of an elongated lower lip which is deeply grooved along the top. Six slender stylets lie in the groove and are the weapons by means of which she pierces the skin of her victim and sucks the blood. The stylets are the highly modified mandibles, the hypopharynx and labrum. The comparatively thick lower lip, or labium, which constitutes

the bulk of the proboscis, does not enter the wound; it is bent back out of the way as the stylets are thrust deeper and deeper into the flesh. Saliva is injected into the wound along a very fine narrow channel in the hypopharynx and this sets up irritation and produces a little local inflammation that draws a plentiful blood supply to the spot; it is also the means by which disease organisms are introduced by those mosquitoes that transmit malaria, yellow fever, dengue fever and filariasis.

The male mosquito usually has long tufted palpi. The antennae of the male usually have many more and longer hairs than those of the female. These setae are believed to serve as sound receptors, which respond to the frequency of the female's wingbeat before mating. Males usually emerge a day or two before females, and they soon assemble, sometimes in hundreds, at sunset and sunrise, in a characteristic hovering flight called the ''mating swarm''. In spite of some early controversy, it is now a well-established fact, not only for mosquitoes but for many other Diptera, that the ''swarm'' is a device for assembling the sexes and that mating takes place after a female enters the swarm. Females need to mate only once, early in their lives, whereas males presumably continue swarming for the rest of their lives. Therefore, mating is observed usually only during the first few days after emergence.

Before swarming, the long hairs of the males' antennae, which are arranged in whorls, are erected by internal blood pressure. In this state, the antennae are sensitive to the frequency of the female's wing-beat and presumably they begin to vibrate when she approaches. The frequencies may differ among species, which may assist in specific recognition. The location of the swarm in relation to surrounding landmarks is important in maintaining conspecific mating. The female must be attracted to the swarming site by the same visual cues that brings the males to the site, because unlike the male she appears to be insensitive to sounds. Undoubtedly, pheromones play an essential role as soon as the sexes are within close range of one another.

After mating, which usually takes place within a day or so of emergence, the female begins to seek a blood meal. In the search the female may travel several kilometres. Some species have been shown to disperse for great distances, even 300-500km. Like the male, the female must also seek a carbohydrate meal at regular intervals, but the blood meal is required to initiate and develop each batch of eggs. Carbon dioxide plays an important role in long range attraction of a blood-seeking mosquito, and the female flies toward increasing concentrations of it. At close range, the female mosquito begins to detect heat if the victim is warm-blooded, and finally she sees the host. The host odour also may be involved in the attraction, but its role is controversial. After the female lands, she may probe the skin a few times, probably searching for a capillary. Only the central stylets, the labrum, the two long hair-like mandibles, the two maxillary blades, and the

single median hypopharynx are inserted into the skin; the trough-like supporting labium remains outside. The tips of the mandibles are needle sharp and are driven into the tissue, followed by the maxillae, whose saw-toothed apices serve to anchor the proboscis, for another deeper thrust. Engorgement usually takes only a few minutes, during which she may imbibe her own weight of blood. A few species may even triple their weight. While the blood is digesting and the first batch of eggs is developing, the female remains inactive, but soon she must seek a suitable place to deposit her eggs. In the selection of an oviposition site she may be guided by an attractant left behind by the developing immature stages of her own species. After oviposition, the female immediately begins to search for a second blood meal; she may complete several such cycles in her lifetime. As many as ten ovarian cycles per female have been recorded in the southern United States of America.

Oviposition behaviour of female *Toxorhynchites* is one of the key aspects of their biology. Unlike many other insect predators, *Toxorhynchites* cannot search for a suitable prey patch but is committed for pre-adult life to the oviposition site selected by the female. Eggs are ejected or dropped in flight following an apparently characteristic ritual. The female flies in a vertically orientated elliptical loop that becomes progressively smaller as she nears the oviposition site. A single egg is forcibly ejected on the downward flight. The female then repeats the pattern or departs. She generally deposits several eggs before leaving the oviposition site. Most observations of oviposition have been in the late afternoon. Aerial oviposition by *Toxorhynchites* has several advantages. It allows oviposition in obstructed container habitats where the female could not have easy access to the water surface, eg obstructed tree holes and bored bamboo. It may also reduce likelihood of capture by predators, especially spiders, which frequently congregate around tree holes. Habitat selection appears to be by visual cues modified by hygrosensory responses to the presence of water vapour.

The females of the genus *Mansonia* show remarkable egg-laying behaviour. The insect sits near the edge of a leaf of some water plant (usually *Pistia*) with her fore and mid legs on the water and the hind legs on the leaf. She then dips her abdomen into the water and by flexion the tip of the abdomen is applied to the lower side of the leaf. In that position the wings which are folded up, rest on the upper side of the leaf and the edge is wedged in between the wing and the abdomen which is almost entirely submerged in the water. The eggs are then extruded one by one and the base of the egg, as it emerges from the abdomen, is fixed on the leaf.

In addition to imbibing water frequently, both sexes of all species probably feed regularly on nectar. Males feed only on nectar. A carbohydrate food source is important in prolonging life, although it is apparently not necessary for development of the first batch of eggs of some species. The species that do not require a blood meal in order to mature

eggs are called autogenous. Many workers have observed mosquitoes feeding at flowers of various species.

Females of most Southern African species require a blood meal in addition to a carbohydrate meal in order to develop a sizeable batch of eggs; these females are called anautogenous. Unlike the carbohydrate meal, which passes into the crop, the blood meal is pumped directly into the midgut where it is enclosed in a transparent sheath of thin cuticle, the peritrophic membrane. Distension of the gut wall helps initiate the production of hormones that stimulate egg development, which proceeds as the blood is digested and assimilated. Digestion may be completed in 24-36 hours at 25°C, 4-5 days at 15°C and about 15 days at 10°C. Egg development takes somewhat longer. After the first batch of eggs has been laid, the female may again seek blood to repeat the process.

Unlike black flies (Simuliidae), which are usually rather specific as to the host animal they feed on, and the environment that the animal is in, mosquitoes, especially *Aedes*, seem to be much less particular. For example, it has been found that females of *Aedes sudanensis* Theobald and *Aedes lucianus* Muspratt were both attracted to man, monkey and fowl. *Culex theileri* Theobald also feeds readily on mammals and birds.

The importance of anopheline mosquitoes in the warmer parts of the world stems primarily from their role as vectors of malaria. However, in tropical Africa both *Anopheles gambiae* Giles and *A. funestus* Giles have also been shown to play a major part in the transmission of bancroftial filariasis under rural conditions. Moreover, research at the Virus Research Institute at Entebbe, Uganda, into the explosive outbreaks of o'nyong-nyong fever in East Africa has revealed the unexpected finding that *A. funestus* and to a lesser extent *A. gambiae* were the sole vectors concerned. This was the first example to be discovered of an anopheline-transmitted virus, and its existence is unquestionably of great importance in relation to the possible development of new strains of pathogenic viruses. McIntosh (1975) reported the isolation of Rift Valley fever virus from *Anopheles coustani* Laveran during an epizootic of this disease among cattle in Zimbabwe.

As regards malaria, it was formerly thought that many species of African *Anopheles* played a local or minor part in malaria transmission. However, experience of house-spraying under a variety of conditions has tended to show that if the main vectors are controlled, the remaining man-biting species are unable to maintain transmission by themselves. Consequently, Gillies and De Meillon (1968) regarded most of the species that are occasionally found with infected salivary glands as "accidental" or, better, as "incidental" vectors and of doubtful public health importance. At the same time, it is seldom possible to be certain that the sporozoites found are of human species of *Plasmodium*, so that the significance of finding infected specimens may be even less. In accordance with this, the classification of vectors given below (modified from Gillies & De Meillon,

MAIN VECTORS		SECONDARY OR INCIDENTAL VECTORS
General	Localized	
A. gambiae Giles	*A. nili* (Theobald)	*A. coustani* Laveran
A. arabiensis Patton	*A. merus* Dönitz	*A. ziemanni* Grünberg
A. funestus Giles		*A. brunnipes* (Theobald)
		A. flavicosta Edwards
		A. marshallii (Theobald)
		A. wellcomei Theobald
		A. pretoriensis (Theobald)
		A. rufipes (Gough)
		A. pharoensis Theobald
		A. squamosus Theobald

1968) is considered to be valid under present conditions in which hyperendemic malaria is still widespread in certain parts of Southern Africa. The incidental vectors are thus regarded as virtually of no importance to those engaged in control or eradication schemes.

This is a contempory view, of course, and it may be that, at some later date when malaria transmitted by the main vectors has been controlled, some degree of low-grade transmission by non-domestic species may still occur in certain areas. Or it may be that malaria will persist among certain sections of the community who, on account of their occupation, are exposed to outside biting species. Should this occur, it will then become necessary to revise our ideas on the importance of incidental vectors.

Although members of the genus *Anopheles* are the only vectors of human malaria, several species of malaria of birds are transmitted by culicine mosquitoes. These diseases may play a decisive role in regulating populations of wild birds, although to date they have not threatened domestic birds.

Of the nearly one hundred and seventy species of Southern African culicine mosquitoes, the largest majority are innocuous to man; most of them suck human blood only occasionally, if at all, and many are either so rare as to be of no account, or so rural and retiring in habits that they cannot be regarded as pests. Culicine mosquitoes are most important for the role they play in the transmitting of arboviruses (or arthropod-borne viruses).

McIntosh (1975) reviewed the available information on the role of mosquitoes as vectors of arboviruses in Southern Africa. Twenty-two viruses, believed to be mosquito-borne, have been isolated in Southern Africa and among these are nine viruses, Sindbis, Chikungunya, Banzi, Wesselsbron, Spondweni, West Nile, Germiston, Bunyamwera and Rift Valley fever, known to cause disease in man. Wesselsbron and Rift Valley

fever viruses also cause disease in cattle and sheep. The known fauna of Southern Africa consists of 220 species of mosquito distributed among 13 genera. Of these 21 species have been implicated as vectors by isolation of virus from collections made in Southern Africa and ten by experimental transmission. Species found most frequently infected in nature are among the culicine genera *Mansonia, Aedes* and *Culex* and include *Mansonia africana* (Theobald) (nine isolations), *Aedes caballus* (Theobald) (35), *Aedes pembaensis* Theobald (13), *Aedes circumluteolus* (Theobald) (88), *Aedes lineatopennis* (Ludlow) (20), *Culex theileri* Theobald (12), *Culex univittatus* Theobald (81), *Culex neavei* Theobald (12). (McIntosh, 1975.)

McIntosh (1975) makes the supposition that under prevailing climatic conditions in Southern Africa *Aedes* species are important as incidental vectors because they survive arid periods in the egg stage whereas maintenance vectors are likely to be found among *Culex* species, and possibly other genera, in which species pass through unfavourable periods as diapausing or quiescent adults, since among mosquitoes the adult is the only life stage known to be involved in viral transmission. There is strong evidence that *Culex univittatus* maintains Sindbis and West Nile viruses among wild birds.

In recent years attempts have been made to find an effective biological control of nuisance and vector mosquito populations. The use of *Toxorhynchites* as potential biological control agents was suggested by several entomologists. Colledge's (1911) tongue-in-cheek remarks on the economic aspects of their use could well be appropriate today:

> "But in the *Toxorhynchites* we believe we have a vegetarian which does no harm to any human being, and is at the same time a deadly foe to the young of other kinds of the genus (family). If can be hired on very reasonable terms. Its working hours are not limited and it is unlikely to go on strike."

Early attempts to introduce *Toxorhynchites* for biological control of pest or vector mosquito populations were reviewed by Steffan (1975) and were generally not considered effective, especially in terms of keeping pest populations below an effective sanitary threshold.

More recent attempts have demonstrated that *Toxorhynchites* can be effective biological control agents (see Steffan & Evenhuis, 1981). In any successful biological control programme, the biologies of both the biological control agent and the target species need to be thoroughly understood.

In the United States of America, extensive research has shown the infection of mosquitoes with nematode parasites of the family Mermithidae may offer a highly effective form of control. The nematodes parasitize larvae of tree-hole breeding species of *Aedes* and *Culex*. The adult nematodes or eggs can lie dormant for long periods. The immature nematodes enter the mosquito larvae via the cuticle and develop in the

haemocoele.The host larvae may remain alive for two or three times the length of the normal larval span. When the immature mermithids finally emerge it is usually via the anal segment causing death of the host.

The research programme in the USA has already progressed to the stage of commercial distribution of the infective stage of the mermithid *Romanomermis culicivorax*, and the initial indications are that control under field conditions is highly successful. This programme has been described as the present pinnacle of biocontrol achievement in medical entomology. The success of *R. culicivorax* has been attributed to the readiness with which it establishes itseslf in new habitats and persists for generation after generation.

With the success of the research programme in the USA it is believed that more attention should be given to the use of nematode parasites as a means of controlling problem mosquitoes in Southern Africa (see Hewitt & Kok, 1979).

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Hazards of Butterfly Collecting — Oman, May 1981.

IN EARLY May 1981 I was prospecting the Wadi bani Kharus Valley in the green moutains of Oman, the Jabal Akhdar. The most interesting of my findings was that an enormous build-up in the population of the well known migrant Caper White (*Anaphaeis aurota*) was under way. All *Maerua* trees in the valley's central part were stripped, and a couple of hours of very hot work revealed that one tree contained 1800 pupae (all of which turned out to be parasite free), and since there were many that I

could not reach the tree must have contained at least 2500 pupae. It could be safely estimated that at least half a million individuals would have hatched in this part of the wadi system over the next ten days. Doubtless such a mass hatching and the complete absence of food plants would have led to a migration of massive dimensions since the situation in neighbouring wadis was similar.

I had started out early, to avoid the worst heat of the day, but the sampling programme extended over the whole day. I was both tired and pleased when I settled in behind the steering wheel of my Land Rover (from the Royal Stables, no less). Rostaq and the first proper dinner for days was only about 35 km away. Wadi bashing is the local term for taking cars up and down the river beds of Oman and it is a fitting term. It needs both concentration and a fair amount of brute force. A few kilometres down the wadi my eyes began smarting a bit. Then vision became blurred, with occasional near total loss. It became almost impossible to see or to drive. A sense of pure panic set in. I was actually going blind! It was one of the most uncomfortable moments of my life. Mercifully, the real explanation hit me after the first wave of panic had receded. Despite the locale, I had contracted snow-blindness (*keratoconjunctivitis nivalis*) through working among the light grey rocks and hillsides in blazing sun for nearly twelve hours without let. Panic turned to relief.

The remaining 30 km back to Rostaq were most unpleasant, but at least a tarmac road was both easier than a wadi, and the colour contrast between tarmac and desert was occasionally discernable. Fortunately there was virtually no traffic. I abandoned the car at the outskirts of Rostaq and walked a short-cut to my house. By now vision had all but disappeared. Dinner was prepared solely by touch. Fortunately the chicken had already been gutted, but it was still not exactly a gourmet meal.

The next two days I could not see well enough to do anything serious. The third day I went back to Muscat with vision still impaired. I found a pair of sunglasses in Rostaq, not smart, but better than none. I now carry a pair of rather smarter sunglasses. I do not like to use them, normally, but I never wish to be in this situation again. — TORBEN B. LARSEN, 358 Coldharbour Lane, London SW9 8PL.

Hadena compta D. & S. and _Spodoptera exigua_ Hübn. (Lep.: Noctuidae) in North Worcestershire.

I would like to record a single example of a female *Hadena compta* D. & S. at my light trap in Blackwell, North Worcestershire (SO 995 724) on the night of 6.vii.1988 — I believe this is a new County record for this species, which appears to be rapidly spreading northwards.

On the morning of 22 October 1988 I was pleased to find a single male specimen of the immigrant species *Spodoptera exigua* Hübn., also in my

Blackwell trap. Otherwise, it had been a poor night for moths — the only other notable capture being *Thera juniperata* L. which is a well established autumn moth in the garden. — M.D. BRYAN, Keeper of Natural History, Birmingham Museum.

A late or second brood *Cynaeda dentalis* D. & S. (Lep.: Pyralidae).

Whilst running my m.v. light on the east cliff at Portland, Dorset on 8 September 1988, I was surprised to note no less than six males of *Cynaeda dentalis*. Perhaps this suggests a second generation of this species in 1988 — and an interesting confirmation of the observations of E.G. Smith (*Ent. Rec.* **101**: 36). — R. DARLOW, Fairfield Road, Blandford, Dorset DT11 7BZ.

Migration of *Cynthia virginiensis* Drury (Lep.: Nymphalidae).

W.J. Tennent's interesting note and query **100**: 249) concerning the sighting of a specimen of this butterfly at sea 28°45'N/75°41'W is I believe readily answered. The species is common in the Atlantic seaboard states of Florida, Georgia and the Carolinas where it is a well-known migrant, and doubtless it is from there that the butterfly set out across the ocean. On the other hand I can find no record of *virginiensis* for the Bahamas, although it may well be a very rare and casual migrant to those islands. Unlike *Vanessa atalanta* L. and *Cynthia cardui* L. which also have migratory tendencies, *virginiensis* has a widespread distribution in South America, and it has been recorded on a number of occasions on the islands of Tristan da Cunha, two thousand miles from the coast of Brazil and even further from Uruguay or the Argentine.

Of the other two species mentioned above *V. atalanta* although recorded from Bermuda, Cuba, Jamaica and Hispaniola appears not to have been noted in the Bahamas, while *C. cardui* has been seen, usually as a vagrant, on many islands of the West Indies, yet I know of only one definite record for the Bahamas, a specimen I caught on New Providence Island, 24.xi.1945. — B.K. WEST, 36 Briar Road, Dartford, Kent.

***Thera cupressata* Gey. (Lep.: Geometridae) in the Channel Islands — an update.**

Since this species was first noted in my garden in October 1985 (*Ent. Rec.* **98**: 217-218) it has been seen there every year, the numbers gradually increasing until this year a total of twelve specimens were noted, six in July and six in October. As reported by Peet (*Ent. Rec.* **99**: 131) larvae (and a pupa) were beaten from large *Cupressus macrocarpa* in the garden in August 1986 and have also been found in subsequent years. The adult moth has now been taken in Alderney (*Ent. Rec.* **99**: 131) and at two further sites in Guernsey and also, I believe, in Jersey.

Although it is not a known migrant Pratt has reported that the first specimen known to have been taken in mainland Britain was accompanied by migrants (*Ent. Rec.* **100**: 180). The second mainland specimen recorded by Brown (*Ent. Rec.* **101**: 24) was also associated with an immigration. Migration could be the reason for its sudden appearance and establishment in Guernsey where most of the common migrants are well known and which is only 15 miles from the French coast, but could it have been imported?

Enquiries made by my wife at a local nursery have revealed that all the major nurseries on the island import conifers from a distributor in Holland who in turn receives trees from "all over Europe" but in particular from France, Belgium and Holland itself. This practice began just before the moth was first noted here, before then trees were imported from England. I had hoped that this was the answer but unfortunately further enquiries discovered that the English supplier also obtained trees from the same Dutch source, so if importation had been the reason for the appearance of the moth here then perhaps by now further specimens would have been seen on the mainland, unless of course the milder climate of the Channel Islands has allowed it to survive only here. — P.D.M. COSTEN, La Broderie, Route de la Claire Mare, St. Peters, Guernsey.

***Heliothis armigera* Hübn. and *Lithophane leautieri hesperica* Bours. (Lep.: Noctuidae) in Cambridgeshire.**

I would like to record the capture of a specimen of *Heliothis armigera*, the Scarce Bordered Straw, at Alconbury, Cambridgeshire, on 19/20 October 1988, by Matthew Rowlings. This appears to be the first published County record for this species.

On 1st October, Matthew also recorded a specimen of *Lithophane leautieri*, Blair's Shoulder-knot, at Somersham, Cambs, with a further eight over the next few days. Although this month was first noted in Cambridgeshire in 1983 by Majerus (*Ent. Rec.* **97**:30-31), these records would strongly suggest this species in established and breeding in Cambridge. — B. DICKERSON, 27 Andrew Road, Eynesbury, Huntingdon, Cambs.

Some odd, early records of Lepidoptera in Wales.

In response to the exceptionally mild climatic conditions in November and December 1988, it became clear that a few individuals of some moth species had really been fooled into believing that Spring had arrived very early, or perhaps that Summer had not yet gone away.

Amongst the firm believers in an early Spring were specimens of the Dotted Border, *Agriopis marginaria* Fab. on 29.xii.88 and 30.xii.88, and the Spring Usher, *Agriopis leucophaearia* D. & S. on 28.xii.88 and 1.i.89. In the same category, but even less likely was a single specimen of a female

Early Thorn, *Selenia dentaria* Fab. captured on 30.12.88. Its large size suggested that it was a potential first brood insect. All of these specimens were taken by myself at Tregaron in a Rothamsted Trap.

Even less seasonal were the seekers of the late Summer sun. A fine specimen of the Hebrew Character, *Orthosia gothica* L. appeared in the trap at Tregaron on 5.xi.88, and another specimen was taken at light by Peter Holmes at Salem, near Penrhyncoch, Aberystwyth on 11th November. On 6th November Peter also captured a single specimen of the Dark Arches, *Apamea monoglypha* Hufn. at the same locality. — I.J.L. TILLOTSON, Chief Warden, Tyloed, Tregaron, Dyfed SY25 6JF.

Painted Ladies (*Cynthia cardui* L.) eaten by a bee-eater aboard ship at sea.

On the morning of 15th April 1988, Captain E.A. Jones, master of the M.V. British Steel, and his crew were in for a surprise. Off Cap Finisterre on the French coast and sailing towards Land's End they suddenly found themselves in a swarm of several dozen butterflies and two or three species of moth. An excellent drawing from the ship's log (kindly sent to me by Captain L. Coombs of the Meteorological Office, Bracknell) clearly shows the butterflies to have been Painted Ladies (*Cynthia cardui* Linnaeus), while the moths must remain unidentified.

The arrival of so many butterflies aboard ship was clearly unexpected by Captain Jones, though there are other such records in the literature. The log expresses special surprise that the swarm should have arrived since there had been southeasterly winds only of force 4, "nothing exceptional". To the "delight and entertainment of the crew" a bee-eater (*Merops apiaster*) also turned up on board and promptly began to catch and eat the Painted Ladies. A shrike and a siskin-like bird also arrived on board.

The observations are particularly interesting since the date coincides well with several observations of migrating Painted Ladies in the Mediterranean area *and* with the sudden arrival of Painted Ladies in southern Ireland, exceptionally early in the season. The major spring invasion of Painted Ladies into southern England took place only in May. When more data have been gathered and the meteorological data studied it is my intention to try to link all the information in a summary article. — TORBEN B. LARSEN, 358 Coldharbour Lane, London SW9 8PL.

***Mythimna l-album* (L.) (Lep.: Noctuidae) in Kent.**

A specimen of the L-album Wainscot, *Mythimna l-album*, was taken on 20 September 1987 in an m.v. trap operated by my brother, John Owen, in the garden of Eastbridge House, Dymchurch, Kent. J.M. Chalmers-Hunt (*in litt.*) thinks this is the second record for Kent, the first being on 9 September 1934 at Dungeness. — D.F. OWEN, 2 Shelford Place, Headington, Oxford.

Records of three species of *Colon* (Col.: Catopidae).

C. zebei Kr.: I possess an example of this species from the duplicate-boxes of my late friend G.H. Ashe, who seemingly had not identified it. It is labelled "The Birks, Nethy Bridge, rotten birch, 14.vii.54". Not only is such a habitat most unusual for a *Colon* but *C. zebei*, rare and little recorded like most of the genus, appears extremely so in Scotland and to be hitherto unknown from Strathspey; Fowler (1889, *Col. Brit. Isl.* **3**: 69) under *C. dentipes* v. *zebei*, gives one Scottish record "Balmuto, Fifeshire (Power)". I took the species very sparingly on Otford Downs, West Kent, in May and June 1950, by evening sweeping, with the more common *C. brunneum* Latr. From others which it resembles, *zebei* is readily separable by the character upon which D.K. Kevan (1946, *Ent. mon. Mag.* **82**: 256) lays stress: namely that of having the elytral side-borders, in dorsal view, finely visible from base to middle.

C. latum Kr.: a more distinctive species of which I had the pleasure of securing a fine male by sieving moss in a very small shaded area in Wychwood Forest, Oxon (15.iv.54), while in the company of the late R.W. Lloyd, who had obtained three or four at the spot within the previous fortnight. It was the only *Colon* encountered by either of us in an afternoon's work. I cannot say whether there is already an Oxfordshire record of *C. latum*; but since Lloyd seems never to have published his find, it may be as well to remedy the omission.

C. rufescens Kr.: decidedly the rarest of all our species, taken in very small numbers by G.C. Champion in the latter part of last century at two Surrey localities on the North Downs, Caterham and Guildford. It is, however, not generally known that the species has occurred in the present century in a second county, Dr N.H. Joy having captured a "fine male" at P. Harwood's special *Colon* and *Leiodes* site — a chalk hillside — at Burghclere near Whitchurch, N. Hants, 21.vi.10 (1910, *Ent. mon. Mag.* **46**: 267). The record is very liable to be overlooked, since it is given no prominence and *C. rufescens* is omitted from the index to that volume (being covered by an "&c."). Both Joy and Harwood doubtless revisited the site a number of times in the following year and may have taken further specimens. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

***Atheta standiella* Brundin (Col. Staphylinidae) in Norfolk, East Inverness, Wester Ross and Shetland.**

A. strandiella was added to the British list by Hammond & Bacchus (1971 *Entomologist's mon. Mag.* **107**: 153) on the strength of a single male collected by Mr M.E. Bacchus in carrion on the Isle of Foula, Shetland in July 1963. At the time, no other examples could be found in the collections at the British Museum.

I have been unable to find any other published records of the species in

Britain and, having come across the species on a number of occasions, thought that I should place these on records. The data on my captures are:-

Birrafirth, Shetland 26.vi.76 — two males in flood debris at sea level.

Yell, Shetland 28.vi.76 — one male in sheep dung at sea level.

Catfield, Norfolk ix.79 — one male in fen litter at sea level.

Loch Garten, East Inverness vii.79 — one female in carrion; v.80 one male in fruit trap; ix.85 one male in pitfall trap; 30.x.85 one male in carrion trap; all at 250 m.

The Saddle, Wester Ross 18.vii.88 — three males in moss, altitude uncertain, though probably about 1000 m.

Though it has rarely been found, these records indicate that *A. strandiella* is widespread in Britain. Elsewhere it has been recorded from throughout Scandinavia and in much of Central Europe.

Apart from indications that it tends to occur in damp situations, there is little information to suggest a habitat preference for the species. Brundin (1953, *Norsk. ent. Tidsskr.* **9**: 1) recorded the species from sphagnum, at dead fish lying on spagnum and from a birch stump oozing sap. Palm (1970 in *Svensk Insektfauna* **9** Coleoptera Fam. Staphylinidae pt 6, p 238) refers to its occurrence in damp habitats such as sphagnum, adding that it has also been taken in dead fish left as bait and in hen and pigeon dung. He refers also to its unusual occurrence in Norway in horse dung on dry ground. Lohse (1974, in *Die Käfer Mitteleuropas* ed H. Freude, K.W. Harde and G.A. Lohse vol 5, 206) similarly refers to its occurrence in damp situations mentioning specifically sphagnum.

I thank Mr P. Hammond for confirming the identity of one of the specimens from Shetland and one from Loch Garten. — J.A. OWEN, 8 Kingsdown Road, Epsom, Surrey KT17 3PU.

A hardy *Hofmannophila* and a beetle.

In February 1988 I embarked upon a long-overdue clearout of my garage — an internally dishevelled domestic space which, for all its faults is at least frost-free. Amongst the detritus was a half-empty packet of slug pellets of the highly compressed and blue-coloured variety. At the bottom of the packet were a number of lepidopterous cocoons made from half-eaten pellets spun together with silk. A considerable volume of frass, most of it blue in colour attested to the diet of the larvae.

Eight cocoons were removed and placed in a closed plastic box. In early April two very large female *Hofmannophila pseudospretella* Staint. emerged (all the remaining pupae died without forming up). It is interesting that the larvae managed to feed up on a diet, presumably based on compressed bran, which contained a high concentration of metaldehyde, a nominal poison, although this may have contributed to the unusually high pupal mortality. I do not know if the blue colouration was simply a dye, or a copper-based compound.

The eight cocoons, together with the dead pupae, remained in the closed plastic box until, on returning from holiday in late August 1988, I noticed a small beetle crawling over the cocoons. This proved to be a male *Ptinus fur* L. (Col.: Ptinidae), a widely distributed and fairly common "food storage" species. Although I was unable to locate evidence of the early stages of this beetle, it must have emerged from the material in the box. Whether the larva fed on the slug pellets, or the remains of the *Hofmannophila* is unknown.

My thanks to John Owen for identifying and commenting on the beetle. — PAUL SOKOLOFF, 4 Steep Close, Orpington, Kent.

***Oxypoda longipes* Muls. & Rey (Col.: Staphylinidae) in the London suburbs far from moles' nests.**

An *Oxypoda* found in my former garden at Blackheath at roots of grass close to a fence (v.73), and assumed at the time to be the common *O. lividipennis* Mann., proved later to be a male of the above-named species — a far more surprising capture. *O. longipes*, once extremely rare, has since been found to be widespread in moles' nests; but these animals have never, in my time, existed in the locality or indeed anywhere near it.

There are two possibilities: either the beetle was a stray, accidently transported from much farther out of London; or the species is not exclusively attached to moles' nests. Of these, the latter on the whole seems the likelier. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

***Morophaga choragella* D. & S. (Lep.: Tineidae) in Buckinghamshire and Northamptonshire.**

I believe that *Morophaga choragella* is considered to be a very local species in southern England. Because of this I was sorry that I recently had to grub out a huge sycamore stump from my garden which had become seriously infected with honey fungus (*Armillarea mella*), a fungus dreaded by gardeners. Larvae of *choragella* had fed on the rotten wood and tree polypores of this stump, in large numbers, for the past few years.

I have noted this species additionally in Buckinghamshire at Gussetts Wood, on 17.viii.1974, and also took a single specimen at light in Yardley Chase, Northamptonshire on 6.viii.1988. Volume 2 of *Moths and butterflies of Great Britain and Ireland* does not give Northamptonshire as a known locality, so perhaps this is a new County record? — G.E. HIGGS, The Cottage, Willen, Milton Keynes, Bucks MK15 9AD.

OBITUARY

The Rev. Jack Vine Hall, 1912-1988.

It is with great regret that we have to record the recent death of the Rev. Jack Vine Hall of Melmerby, Cumbria. Born in Wimbledon on 21 August

1912 he was educated at St. Paul's School and King's College, London and attained the degree of B.D. He became a Deacon in 1936 and his first curacy was in St. Pancras, London. In 1938 he moved to Cumberland (as it then was) and remained in the Carlisle Diocese for the remainder of his life. At an early age he became interested in natural history — an interest fostered by his father who also was interested in such matters. His first Living was at St. Peter's Church, Kells near Whitehaven and it was here that he first started collecting lepidoptera seriously and also studying the flora of the near-by Lake District. From Whitehaven he moved to Hutton Roof (then in Westmorland) 1952-1962, then to Threlkeld near Keswick, 1962 until his retirement in 1977. He retired to the little village of Melmerby. In all these places he operated his mercury vapour trap, keeping meticulous records and forming a very good collection of the local heterocera (including the Pyralidae — but excluding the other so called microlepidoptera).

During his residence in Cumbria he contributed numerous notes and articles to this journal and to the *Entomologist's Gazette*. All these publications revealed him as a competent field naturalist with ever a fresh view to bring forward and his work added greatly to our knowledge of the fauna and flora of the Lake District. He was keenly interested in the distribution and variation of our "good" species — *Aricia agestis* (now *artaxerxes*), *Coenonympha tullia* and the British *Erebia* species — *epiphron* and *aethiops*. He was particularly pleased to be associated with the Cumbria Trust for Nature Conservation (now Cumbria Wildlife Trust) in acquiring the Smardale Nature Reserve — one of two known colonies of *Erebia aethiops* in England. He was on the Trust committee for many years and gave much time to the Association of Natural History Societies in Cumbria which produces an annual Bird Report, but which includes considerable space to other apects of natural history.

In his later years Jack did not do a lot of collecting but amassed a fine collection of photographs of butterflies, moths and flowers.

Apart from natural history he was a keen student of classical music — both old and modern. Bela Bartok was one of his favourite composers though his tastes were catholic and most good music was to his liking. He also kept up a keen and lifelong interest in theology.

Much of Jack's collection of lepidoptera has gone to the British Museum (Natural History) where it will be of great interest as containing many northern forms of insects, an aspect of study in which he was very interested.

He married in 1938 and had one son, Francis, and one daughter, Jennifer, who with his wife, Nora, survive him.

To them we offer our sincere sympathy. He will be much missed also by many friends, entomologists and others, in this north-west corner of England.

Neville Birkett.

The Dragonflies of Essex by **Dr. E. Benton.** 140 pp including three colour plates; Paperback. The Essex Field Club. 1988. £5.95.

The stated aims of this booklet are to stimulate further interest in dragonflies and to communicate the results of a recent survey with a view to contributing to the conservation of these insects in Essex.

Forty-four pages are given over to the current and past status of each of 28 species and tetrad maps are included for 22 of them. A description of each species is given together with observations on behaviour and habitat requirements. Understandably, the "star" species for Essex, *Lestes dryas* and *Coenagrion scitulum*, receive generous treatment concerning the rediscovery of the former and brief recorded presence of the latter. A further nine species on the Essex list, for which there have been no records since 1903, are dealt with in an Appendix (3 pp).

The various habitat types that occur within the county are covered and twenty sites are described in some detail. The text is supplemented by five tables indicating the species breeding at several types of habitat, the species recorded on each of 13 Essex rivers, and at each of a selection of 21 sites. Evidence of breeding is indicated where known. A further table gives separate lists for a selection of ten Epping Forest ponds, one of which has 19 species recorded.

The survey covered the period 1980-87 and details of its progress and the efforts made to obtain even coverage are given. The end result is illustrated by summary maps.

There is an Appendix (17 pages) covering the history of dragonfly recording within the county. This includes some interesting background information on the personalities involved in bygone years enabling the reader to associate more closely with the names attached to historical records. A series of 10 km sq. maps indicates the progress in coverage since 1903 and two tables show species recorded in eight consecutive periods, commencing before 1840.

Unfortunately, the colour plates, which depict two species and a prime site, are not of the same quality as the cover photograph of *Sympetrum sanguineum*, but nor are they essential to the enjoyment of this book. An identification key is included, with drawings depicting critical features. It is aimed at local beginners and limited to the range of species that might be found in Essex today, including the rarities and *Coenagrion scitulum*.

Other sections deal with natural history, suggestions for further work, and a table of recorded flight periods during the survey. The information contained in this booklet is of great value now, in highlighting conservation needs, and in the future as a benchmark against which our conservation efforts, and other factors affecting distribution, can be judged.

An essential addition to the library of any naturalist living in or near Essex, it deserves a wider audience, and similar coverage of other counties would be most welcome.

Harry Eve.

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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

(Founded by J.W. Tutt on 15th April 1890)

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Notes on some of the British Nepticulidae by A.M. Emmet. A collection of reprints from the Record published between 1971 and 1974 on the Nepticulidae, as issued, in printed wrapper. Price £5. Contact Editor on 0689-59034.

LEPIDOPTERA ON BARRA

MICHAEL HARPER[1] AND MARK YOUNG[2]

[1] *Cherry Orchard, Bullen, Ledbury, Herefordshire.*

[2] *Department of Zoology, University of Aberdeen, Tillydrone Avenue, Aberdeen*

BARRA is one of the southernmost of the Outer Hebrides, well known for its attractive and varied flowers and scenery, and in July 1987 we visited the island to see if its Lepidoptera were equally diverse and interesting.

Existing knowledge of the fauna of the Outer Hebrides has been admirably summarised by Waterston *et. al.* (1981) but, although that list is the result of many previous surveys, Waterston was sure that other species remained to be found. At that time the number of species known from Barra was 211, or 8% of the British fauna, and it is of interest to consider why the island should harbour so few. Current theories propose several factors that influence the size of an island's fauna, and these are principally its isolation from a source of colonists, its area and its habitat diversity.

It is proposed that an isolated island will have a slow rate of immigration, even by such mobile animals as Lepidoptera; that a small island will suffer a relatively high loss of species due to random extinctions of small populations; and that a small island is likely to have a less diverse set of habitats than a large island. The balance between loss and gain of species will obviously result in fewer species on smaller, isolated islands.

Barra is quite small, only about 7 x 13 km, and is over 80 km from the mainland. However, it is close to the other larger Outer Hebrides and is very diverse in its range of habitats (although some of these habitats may be too small to be properly effective). A further factor is that the climate is so predominantly atlantic that this will also limit the species that can survive there. The size of its fauna presumably reflects this balance. Even if Barra has rather few species, it more than makes up for this by the unusual forms in which many of these species appear. These are discussed fully by Waterston, as well as being illustrated in many books.

Our hope that we might find previously unrecorded Lepidoptera was well founded and from our total of 135 we added 12 species to the list for the Outer Hebrides and a further 20 to Barra's own fauna. These are listed in Table 1 but none are especially unexpected in that they are all species already known to occur on the adjacent mainland. However, some show points of interest. We found an Elachistid amongst damp grasses and sedges which defied identification until dissection. This species was found initially in abundance at Scurrival one early dusk, climbing the grass and sedge stems and making short flights amongst them. There was then a brief but torrential rainstorm, which stopped the activity and we saw only one or two further specimens on several return visits. On dissection these proved to be *Elachista albifrontella*, but we achieved this identification only with the help of E.C. Pelham-Clinton to whom we are most grateful.

Superficially the specimens show very little resemblance to *E. albifrontella*, in that the normally clear pale markings are replaced by rather obscure and somewhat elongated ones. All were different from normal, with no clear fasciae and the remaining feint marks being on a pale grey ground colour. The heads were whitish-grey, all darker and less bright than is usual. Our previous experience has been that this species is usually invariable and so perhaps the Barra specimens represent a local form.

Of the species recorded as new to the Outer Hebrides, the most notable was *Phyllonorycter quinqueguttella* which, although quite widespread in Scotland, is always local (Heath & Emmet, 1985). We found it only on the southern moorland slopes, as mines on *Salix repens* from which adults were reared. *Cydia compositella* we found in rich meadows at the north end of Barra and is another species which is very local in Scotland, but it has been found previously as far north as Sutherland. One species already recorded by Pelham-Clinton, but nevertheless of great interest, is *Perizoma bifasciata* which occurs on the island's west coast. This moth is generally much more southern in its occurrence and on Barra it presents a pale and variegated form. Finally a dramatic entomological event was the great abundance of *Arctia caja* on the sand dunes. When we ran a u.v. light at Traigh Eis dunes we attracted dozens of "tigers" and little else.

A feature of Barra is the wide variety of habitats present. The north end of the island is grazed only by cattle and rabbits and so has many species-rich and luxurious meadows. These include maritime cliff grasslands, calcerous machair and marshland (filled with corncrakes!) and at Scurrival these habitats exist in an attractive mosaic. The machair recurs at many places along the west coast and seems generally rather less grazed and so more luxurious than on some other islands, such as Tiree. Extensive and typical sand dunes also occur at a number of places on the west coast but the cliff slopes are flower-rich only at Scurrival and Eoligarry in the north and are rather acid in nature elsewhere. Most of the interior of the island ranges from uninteresting, improved, permanent grassland to dry acid moorland but around Allt Heiker, above Earsary, there is an attractive and interesting peat bog and at The Glen, above Castlebay, there is a small area of flushed ground with *Carum verticillatum* (Whorled Caraway) and other marsh plants present. Of the lochs the most attractive and interesting seemed to be Lochan na Cartach, whereas most others were rather unproductive and devoid of plants or animals. Salt marsh is almost absent apart from some tiny areas near Northbay and a fringe along the south side of Traigh Mhor. The scarce halophil beetle, *Octhebius punctatus*, still occurs at Traigh Mhor.

Barra is nearly but not wholly tree-less. There is a small plantation of conifers and sycamore at Northbay, which also has some well grown alders within it. Quite a number of common species of moth have invaded this plantation but we found it of little real interest. Otherwise there are only

remnants of scrubby woodland. At Balnabodach there are some rowans, birches and sallows, all of which retain some of their associated moths, and sallows are also found scattered sparingly over the island in stream gullies. At Allt, Earsary there are several hazels and some honeysuckle and this is the only site for native hazel. These woodland fragments may be too small to have kept much of their characteristic fauna, although obviously a few species, such as the *Argyresthia* spp, remain.

Undoubtedly the most attractive and richest habitats are those at Eoligarry and Scurrival in the north, where only cattle and rabbits graze. It was there that we found most species overall and most of the interesting ones.

The neighbouring island of Vatersay is also of interest, with rich machair and cliff slope vegetation on the south slopes Heishival, but it does not include vegetation types which are absent from Barra.

Our full species list has been lodged with A.R. Waterston and with the local NCC Officer.

Table 1 Species recorded as new to the Outer Hebrides (VC 110) and to Barra.

Species new to Outer Hebrides	**Species new to Barra**
Phyllonorycter quinqueguttella Stt.	Aspilapteryx tringipenella Zell.
Argyresthia pygmaella D. & S.	Phaulernis fulviguttella Zell.
Coleophora cratipennella Cl. (= tamesis Waters)	Elachista canapennella Hübn. (= pulchella Haw.)
Elachista argentella Cl.	Biselachista albidella Nyl.
Agonopterix nervosa Haw.	Depressaria daucella D. & S.
Bryotropha politella Stt.	Monochroa tenebrella Hübn.
Scrobipalpa artemisiella Treit.	Scrobipalpa samadensis Pfaff
Cydia compositella Fabr.	Dichrorampha petiverella Linn.
C. gallicana Guen.	Lobesia littoralis Humph. and Wst.
Epiblema costipunctana Haw.	Olethreutes cespitana Hübn.
Philedonides lunana Th.	Aphelia viburnana D. & S.
Cnephasia stephensiana Doubl.	Falseuncaria ruficiliana Haw.
	Crambus perlella Scop.
	Catoptria margaritella D. & S.
	Scoparia ambigualis Treit.
	Eudonia angustea Curt.
	E. mercurella Linn.*
	Pyrausta ostrinalis Hübn.
	Hydriomena furcata Thumb
	Spilososoma luteum Hufn.

* Omitted in error in Waterston, 1981.

Acknowledgements

Our thanks are due to Rodger Waterston for the use of some unpublished data and for encouraging our recording.

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***Trachea atriplicis* Linnaeus (Lep.: Noctuidae), the Orache Moth, in Jersey.**

A SINGLE male of this species was caught in the Rothamsted Insect Survey light trap at Trinity, Jersey (Site No. 146), during the period 31.vii to 2.viii.1987 and, so far as I am aware, constitutes a new record for the Island.

T. atriplicis has not been recorded as a resident British species since 1915 when the last specimens were caught at Stowmarket in Suffolk (Heath, J. (ed.) (1983) *Moths and Butterflies of Great Britain and Ireland* **10**: 165. Harley, Essex). However, four assumed immigrants were caught in eastern and south-eastern England in 1986 (Skinner, pers. comm.), and one was caught at St Saviour's, Guernsey on 28.vii.1984 (Long, pers. comm.). Apart from the present record, no further specimens were reported in 1987.

No known migrant species were caught in the Jersey trap around the time of the *T. atriplicis* capture, and so the question of its origin must be considered. When this species was known to be resident in the British Isles, it inhabited damp localities (Heath, J. *loc. sit.*). Such areas exist in the vicinity of the Jersey trap and have previously been suggested as possible sites for *Costaconvexa polygrammata* (Bork.) — another assumed extinct species caught in this trap (Riley, A.M. (1986) *Ent. Gaz.* **37**: 68), and *Lomographa cararia* (Hb.) (Riley, A.M. (1987) *Lomographa cararia* (Hb.) (Lep.: Geometridae). A new species to the Channel Islands and the British list. *Ent. Rec.* **99**: 65-66). These localities should also be investigated for *T. atriplicis* so that the appropriate conservation measures can be taken if it is found to be resident.

Thanks are extended to Bernard Skinner for information on recent captures of *T. atriplicis*; Roger Long, of the Société Jersiaise, for his comments on the occurrence of this species in the Channel Islands and Rosemary Collier for her continued support in operating the Rothamsted light trap at Trinity. — ADRIAN M. RILEY, Dept. of Entomology and Nematology, AFRC Institute of Arable Crops Research, Rothamsted Experimental Station, Harpenden, Hertfordshire AL5 2JQ.

THE OCCURRENCE OF *GRAMMOPTERA* SERVILLE AND *ALOSTERNA* MULSANT (COL.: CERAMBYCIDAE) IN THE BRITISH ISLES

RAYMOND R. UHTHOFF-KAUFMANN

13 Old Road, Old Harlow, Essex CM17 0HB.

Introduction

THIS paper has two objectives: first, to describe the distribution, ecology and habits of this small group of rather dull looking and less conspicuously coloured Cerambycids; secondly, to dispel any lingering doubts there may be over the validity of that beetle universally known as *Grammoptera holomelina*, still quite unknown from the Continent and one which occurs only in this country.

County and vice-county symbols follow Browne (1931); italicised letters denote that it is from there that the beetle has been widely captured; bracketed letters signify dubious or unconfirmed records. *En passant* it is perhaps not irrelevant to observe that there still seems to be — to use that current well-worn *cliché* — a "north-south divide"; entomologists south of the Midlands preferring the mnemonical Brownean symbols for counties in contrast to those others who use the Watsonian range of numerals which are difficult to memorise; (see Kaufmann, 1989 and Allen, 1988).

For the benefit of Coleopterists unacquainted with the history of *G. holomelina* the following is a summary.

Pool (1905) first published in this periodical his description of a new entirely melanic form of *G. ruficornis*, aberrational, in his opinion, rather than specific. That it was a new species was enthusiastically claimed shortly afterwards by Donisthorpe (1905), who with Pool collected over thirty male and female specimens, including several pairs *in cop.*, from the same locality that had produced the latter's original find; between them they must surely have exhausted the stock of that particular Middlesex hedgerow. Dr D. Sharp (1910) who also endorsed *holomelina* as a good species (Fowler and Donisthorpe, 1913) later discovered a specimen in excellent condition in an old collection dating back to the mid-nineteenth century. Thereafter, *holomelina* appears as a separate species, exclusively British, in both the palaearctic Berlin (1912) and Vienna (1929) catalogues, and, of course, as such in all subsequent British catalogues (Beare, 1930; Kloet and Hincks, 1945 and 1977) and in Joy's work on our Coleoptera (1932). Plavilstshikov (1936), too, refers to *holomelina* as confined to England. It is indeed remarkable that no form resembling *holomelina* has ever been found on the Continent.

Henderson (1946), however, in discussing other aspects of *G. ruficornis*, raised some doubts as to whether or no *holomelina* was a genuine species, having examined and compared the genitalia of *holomelina* with those of

ruficornis. He could find no structural difference and only a much darker coloration of the sclerotized portions of the aedeagus. There the matter rested until Duffy (1952) in his Handbook declared that he was satisfied that *holomelina* was a variety of *ruficornis* and not specific. In his Monograph (1953), nonetheless, Duffy again raised *holomelina* to specific rank, restricting himself to the comments that there was "some controversy as to whether or not this species is distinct from *G. ruficornis*" and that (not surprisingly) "no materials or references are available".

In 1988 Mr A.A. Allen kindly undertook to dissect and re-examine specimens of *holomelina* from the Uhthoff-Kaufmann collection of British Cerambycidae. His conclusions are the same as Henderson's, namely, that the genitalia apart from a deeper coloration are identical with those of *ruficornis*. The only real distinction between the two beetles lies in their patently contrasting external appearance, *holomelina* being instantly identifiable from *ruficornis* in the field because of its jet-black colour. "No-one would ever pass *holomelina* over for *ruficornis* when he saw it alive" (Donisthorpe, 1905). Kaufmann (1947) sums up this difference: "No matter in what light, artificial or natural, one views the two insects, *G. holomelina* is startlingly black, almost jet, and *G. ruficornis* . . . (has) that typically dusty golden effect: these differences remain marked even if the specimens are damped . . . *G. holomelina* (is) . . . as distinct in colour as a black cat is beside a tabby". It only remains to add that Mr Allen during his microscopic examination discovered, to quote Rexford's well-known line, some "silver threads among the gold", that is, expressed less facetiously, a few golden hairs among the otherwise typically black elytral pubescence which is so characteristic of *holomelina*.

To conclude: all that needs to be said is that *holomelina* must be once more reduced to varietal from specific status and as such it should appear in any future British or Continental publication on the Cerambycidae.

To clarify the difference between the type species *G. ruficornis* and its four varietal and aberrational forms, Kaufmann's key (1947) is reprinted below.

(Bracketed numbers link contrasting forms)

A. Pubescence blackish, sparser. Puncturation slightly stronger.
   1. Limbs and antennae black ....(v.) *holomelina* Pool (5).

B. Pubescence dusty golden, thicker. Puncturation somewhat less marked.
   2. Limbs variegated, the front pair generally red, sometimes edged or tipped black at the joints, the remaining pairs coloured red and black. Antennae red, joints 3-11 tipped black at joints ....*G. ruficornis* F. (4).
   3. Limbs and antennae rufo-testaceous ....a. *pallipes* Steph. = a. *flavipes* Pic (2).

4. Limbs and antennae piceous ....a. *obscuricornis* Kraatz (3).
5. Limbs and antennae black ....a. *melanipes* Kaufm. (1).

Examples showing the slightest deviation from the above, suggestive of a touch of redness at the joints of the antennae or on the legs are automatically debarred; such specimens must be ascribed to the type *ruficornis*.

The species of *Grammoptera* share one common factor: their life history takes only one year to complete; that of *Alosterna*, on the other hand, spans a two year period.

Grammoptera ruficornis F.

Ubiquitous and without doubt our commonest little Longhorn. It is still abundant, particularly when the May blossom is out, to which it is greatly attracted and usually the first Cerambycid encountered. A very swift beetle which races off the beating tray, taking instantly to flight in sunny weather. There are plenty of records from Wales and Ireland, but the insect becomes increasingly rare in the north of the country (it remains to be found in north Northumberland); Scottish examples are unknown beyond the Forth; this corresponds with the knowledge of its distribution in southern Scandinavia (Hansen, 1960). It is absent from the Isle of Man.

ENGLAND: *BD BK* BX *CB CH CU* DM DT (DY) EC EK EN *ES EX EY GE* GW HF *HT HU IW L LN LR* LS MM *MX MY* ND NE NH *NM NO NS* NW NY *OX SD SE SH* SL SN (SP) *SR* SS *ST* SW SY *WC WK* WL WN WO *WS WW WX WY.*

WALES: *A* BR *CR* DB FT GM MG MN *PB* RA.

SCOTLAND: AY BW ED HD LA RX.

IRELAND: AN AR (CL) CV DO *DU* FE KC (KD) KK LE LK ME NG NK QC RO SG SK WA WC WH WI (WX).

The polyphagous larva is found in the dead twigs and decaying small branches of ash, beech, black alder, blackthorn, broom, buckthorn, dogrose, elder, elm, false acacia, great maple, hawthorn (a favourite habitat), hazel, *Hibiscus syriacus*, hornbeam, horse chestnut, *Ilex*, ivy, lime, mouldy oak, poplar, *Prunus, Pyrus aucuparia, P. malus, P. spinosa*, sour cherry, spindle tree, walnut, willow and wych elm. It does not attack coniferous growths. Its only known predator is the spider, *Amaurobius atropos* Walck.

Pupation depending upon conditions takes place during April and May and can be as short as one week. Upon emergence the beetle may be beaten from ash, beech, blackthorn, buckthorn, cherry, crabapple, dogwood, elder, elm, hawthorn, hazel, holly, horse chestnut, ivy, maple, oak, poplar, rowan, sycamore and willow or swept from *Aegopodium*, apple blossom, dogrose, guelder rose, hawthorn, *Heracleum*, ox-eye daisy, rose bay willow herb, *Stachys*, syringa, *Torilis*, wych elm and yellow deadnettle.

The adult occurs from April onwards until September, becoming scarcer towards the end of the season. There is a single January record. Variable in length, some micromorphous specimens measure as little as 3mm. Very oddly, this so common beetle is largely ignored in all *post*-1960 English works on insects, but Harde (1984) has a good coloured illustration, plate 252, fig. 1.

G. ruficornis F., v. *holomelina* Pool

With a rather scattered distribution ranging from the extreme west to south Northumberland, but confined largely to the south, the Home Counties and parts of the Midlands. Unrecorded from Wales, Scotland or Ireland. A very uncommon variety, only occasionally present with the type.

ENGLAND: BK CH DM EK ES GE GW *HT* LR MX MY NM OX SE SH SN SR WC WK WO WS WY.

The three aberrational forms of *G. ruficornis*, unlike the v. *holomelina*, cannot be detected in the field — they are too agile: hoping to find one or the other of them would entail collecting hundreds of specimens, which in these days of conservation can no longer be tolerated. They are, in any case, extremely uncommon to very rare.

a. *pallipes* Steph. Very rare in this country, but said to be fairly common in Ireland (Johnson & Halbert, 1902).

ENGLAND: EK EN SD.

IRELAND: AR DO DU NK RO (WX).

a. *obscuricornis* Kraatz. There are few published records as this aberration has been largely overlooked. It is probably mixed with *ruficornis* in some collections.

ENGLAND: CH GE MX SR.

a. *melanipes* Kaufm. Very rarely found with the species proper.

ENGLAND: CH HF SR.

IRELAND: NG.

G. ustulata Schaller

An increasingly rare beetle more or less confined to woods in the Thames and Hampshire basins.

ENGLAND: BK (BX) EX GE GW MX NH SH.

Two records from SL and ST are certainly erroneous.

The larva is found mainly in dry, dead or mildewed lichen covered twigs of maple and oak, and in the decaying limbs of the common walnut.

Like *G. ruficornis* pupation takes place in mid-April, with eclosion a week or so later. The imagines which have golden pubescence turning to black at the elytral apex are about from then until August; they may be swept from various plants such as apple blossom, beech, brambles, dogwood, guelder rose, hawthorn, lime, *Spiraea* and Umbellifers.

G. variegata Germar

Generally confined to woodlands in the south, south-east, the Scarplands, north Midlands and a few more northerly areas. There are no Welsh or Scottish records but there is one from Ireland. A scarce local beetle, sometimes mistaken for *G. ruficornis*. Its larger size, grey pubescence and (usually) red abdominal segments and pygidium, particularly in the female, are a guide to its recognition.

ENGLAND: *BK* BX CB CH DY EK ES GE GW HT HU IW L LN LR MX MY NE NH MN NO NS NY *OX* SE *SH SR* ST SY *WK* WN WX.

IRELAND: DO.

The larva feeds in dead oak, pear and sweet chestnut, emerging from April until June, and the imago may be taken from May until August from off aspen, buckthorn, elder, elm, gorse, guelder rose, hawthorn, oak, *Pyrus*, rowan and *Umbelliferae*. It is difficult to collect by beating as it seems to prefer the upper branches of its host trees, descending later in the day; this may account for its apparent scarcity.

a. *nigrescens* Weise = a. *griseipes* Pic. An aberration with the legs and abdomen entirely black. It is probably mixed with the type in our collections.

ENGLAND: NH SH SR.

Alosterna tabacicolor Degeer

Generally distributed from the south-west to the north as far as south Perthshire, but becoming rarer in the northern regions. A local beetle sometimes common where it occurs.

ENGLAND: BD *BK* (BX) CB *CU* DM *DT* DY EC *EK* ES EX *EY* GE GW HF *HT* HU IW L LN LR MM MX MY NE *NH NM NO* NS NW *OX* SD SE *SH* SN *SR* SS *ST* SW WC *WK* WL WN WO WS *WW WX* WY.

WALES: BR CR DB GM MN RA.

SCOTLAND: BW DF ED HD LA PC.

IRELAND: AN DO DU KK QC RO SK WA WI.

The larva feeds in the dead, wet and rotting twigs of hazel, hornbeam, maple and pine. After a two year metamorphosis, the adult beetles emerge in May and are collectable until August by beating elm, holly, hornbeam, maple, oak, rowan, sycamore and willow. It may also be swept from *Anthriscus*, brambles, *Chaerophyllum, Conopodium*, dogwood, elder, elm, hawthorn, hogweed, holly, hornbeam, maple, oak, raspberry canes, rowan, *Salvia, Spiraea, Stellaria*, sycamore, teasel, *Torilis*, wild rose and willow.

This species, which is sometimes mistaken for *Grammoptera ustulata*, helps in the fertilisation of the plant *Listera ovata* (see *J. Ent. Soc. S. Engl.*, 1932, **1** (1):4). *A. tabacicolor* is nicely illustrated in Lyneborg (1977, plate 46, fig. 311) and by Harde (1984, plate 252, fig. 2.).

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Salpingus ater Payk. (Col.: Salpingidae) in Wales.

AMONG the very many duplicates kindly given me by the late Philip Harwood was an example of this scarce beetle, labelled "Gower/v.26". It almost certainly constitutes the first record of *S. ater* for Wales, Mrs M.J. Morgan having informed me that she has no note of a previous one. In fact the occurrence of the species in South Wales is surprising in view of its apparent restriction, otherwise, to the Scottish Highlands — apart from one or two southern records which require confirmation.

This insect is closely similar to its locally common English counterpart *S. reyi* Ab. (*aeratus* Fowler, *nec* Muls.), but may normally be recognised by its deep black colour with little metallic reflection, contrasting with the brassy tint of *reyi.* Structural characters on the other hand are very hard to pinpoint; those ascribed to the two species tend to differ from one author to another, and when tested are often found unsatisfactory. It was not until 1947 that the late Dr K.G. Blair, an authority on the Salpingidae, reversed his earlier opinion that *ater* and *reyi* were but one species (*Ent. mon. Mag.* **83**: 68), as a result of examining two specimens of *ater* sent by Harwood (doubtless from Speyside). Unfortunately, however, he said nothing of what he considered to be their crucial distinctions. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

Atheta (Dimetrota) puncticollis Benick (Col.: Staphylinidae) in S. Devon and the Scottish Highlands.

This species, added to the British list on a specimen from Rothiemurchus Forest, E. Inverness, in 1938 (Allen, 1940, *Ent. mon. Mag.* **76**: 81-2), appears so very little recorded — if at all — since then, that the following may be of interest . The late G.H. Ashe found it very sparingly both in his home district of Colyton, S. Devon, and in Speyside, in the early 1950s. I have four specimens of his taking, and believe there were one or two others in poor condition among his duplicates; perhaps the most interesting is one with the data "Colyton/elm stump/16.iii.52". Since *A. puncticollis* is not a subcortical or rotten-wood species, this could, in March, have been a hibernation site. I have heard of one or two other English captures, but have no details. As regards its occurrence in Scotland, two of the Ashe specimens before me are from the River Dulnain "in tufts", 1.vii and 30.vii.54; and another from Nethy Bridge "in marsh", 8.vii.54, both places being in Speyside. Finally, my friend Prof. J.A. Owen asks me to include with these few records his capture of a single female at Braemar, S. Aberdeens. (27.vii.77) in sheep dung. The nearest ally of *puncticollis* is undoubtedly *macrocera* Thoms., both having wholly unmargined temples and genitalia of the same general pattern. Both, also, are inhabitants of dung.— A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

A NEW ABERRATION OF *GYMNOSCELIS RUFIFASCIATA* (HAWORTH) (LEP.: GEOMETRIDAE) — THE DOUBLE STRIPED PUG.

by Colin W. Plant

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A PARTICULARLY striking form of *Gymnoscelis rufifasciata* (Haworth) which I took at m.v. light in the Wyre Forest National Nature Reserve on 18 August 1984 does not appear to conform to any known aberration or variety. Lempke (1951) lists eight varieties of *G. rufifasciata* of which f. *albescens* Lempke is the nearest to the present example with basal and central area of forewings whitish. In the absence of evidence to the contrary I therefore describe this Shropshire specimen as a new aberration which I choose to call ab. *albofasciata.*

G. rufifasciata (Haworth) ab. *albofasciata* ***ab. nov.***

FOREWING (UPPERSIDE) with basal one-third, up to and including ante-median cross-line, with normal pattern partly masked by a preponderance of grey scales. Median fascia pure white with sparse greyish irroration. Post-median cross-line, and wing distal to this line, normal though, like the basal area, suffused greyish with the two reddish-grey clouds in the termen near the apex partly confluent with the ground colour of the wings. Viewed at arms length the distal third of the forewing appears grey. Costa greyish. Cilia of normal coloration except in region of the white median fascia where they are pure white. Stigmata absent.

HINDWING (UPPERSIDE) with outer third grey, devoid of markings, this coloration extending slightly basal to the post-median cross-line which shows whitish against the grey ground colour. The remaining basal two-thirds white with faint grey irroration becoming more obvious at the extreme base of the wing. Cilia grey. Stigmata absent.

UNDERSIDES of all four wings with ground colour white. A scattering of grey scales in the basal third of fore-wings. Outer third of all four wings with dark grey scales contrasting with the lighter grey cilia. Discal spots obvious on all four wings below.

The specimen, which is female, was exhibited at the 1988 annual exhibition of the British Entomological and Natural History Society and was photographed for inclusion in that society's journal (Vol. 2, plate III).

Acknowledgement

I am grateful to my friend Adrian Riley at the Rothamsted Experimental Station, Harpenden, Hertfordshire for confirmation of the genitalia of this specimen, and to NCC West Midland Region for permission to record insects in the Wyre Forest.

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Hazards of butterfly collecting — Dhofar, October 1979

ONE fine morning in October 1979 I joined a helicopter of the Oman Air Force (SOAF) on assignment to the civil aid division. I had been promised that for a whole day it would take me from locality to locality on the incredible wooded escarpment of Dhofar, the ecology of which is unique. There is no other way of sampling large areas of the scarp except through the use of a helicopter, but I also freely have to admit that I find helicopters great fun as a means of transport. Most of the pilots were British seconded officers who enjoyed not being bound by the low-flying regulations back home, which made for some very exciting trips, flying up steep nullahs with the rotor blades only a few feet from the adjacent mountain sides.

After a few stops where the medics treated sick mothers and children and the engineer surveyed various water projects, we landed at a more substantial settlement — with two hundred residents or so. This was a longer stop, and I had the possibility of surveying the butterfly fauna in some detail. The area was splendid, with dense forest at peak development, so contrasting with stereotype views of Arabia. I made many useful observations, but all good things come to an end. A strong whistle informed me that I must get back to the helicopter, and I crawled in. The rotor started whirling, and the chopper readied for take-off. As usual the load-master kept the door open till the take-off had been effected.

Just as the rotor speed reached take-off velocity I saw coming towards us a female of the Oriental butterfly known as the Great Eggfly (*Hypolimnas bolina*). This is a huge butterfly, till then quite unknown in Arabia, though there is a population on the island of Socotra. For a dedicated entomologist there was only on thing to do. I rushed towards the exit, jumped over the feet of the load-master, and reached the door of the helicopter. I jumped out just as the helicopter lifted off, the only time I have actually left an airborne aircraft, except for my one and only parachute jump. I rushed towards the butterfly, but it and I reached the downdraught of the rotor at the same moment. The butterfly was wafted away in the turbulence of the downdraught, but I was close enough to make sure of its identity. It *was* the first ever Arabian specimen of the Giant Eggfly.

The helicopter landed again, and I re-entered it. I did not connect my microphone link with the cockpit. Shortly the load-master motioned me to do so. So I did. I got a torrent of abuse from the captain — deservedly so. What the hell did I think I was doing! He could have me court-martialled!! I was lucky he had even bothered to come back and pick me up!!! And he was perfectly right, of course.

I later had the chance to share a beer with my pilot. He had mellowed a bit. He still thought that jumping out of flying helicopters was not only silly but very dangerous. But he was willing to credit that it had been done in a good cause! TORBEN B. LARSEN, 358 Coldharbour Lane, London SW9 8BL.

ENDOTRICHA CONSOBRINALIS ZELLER (LEP.: PYRALIDAE) — A SPECIES NEW TO BRITAIN

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DECEMBER was not a month I expected to see *Endotricha flammealis* (D. & S.) fluttering round my kitchen. However, closer inspection on 24 December, 1987 revealed a battered pyralid similar to, but distinct from, *E. flammealis*. The specimen was wet and, considering the rather abnormal damage of the insect, I presumed it to have come from Israeli celery (*Apium* sp.) my wife was preparing at the time.

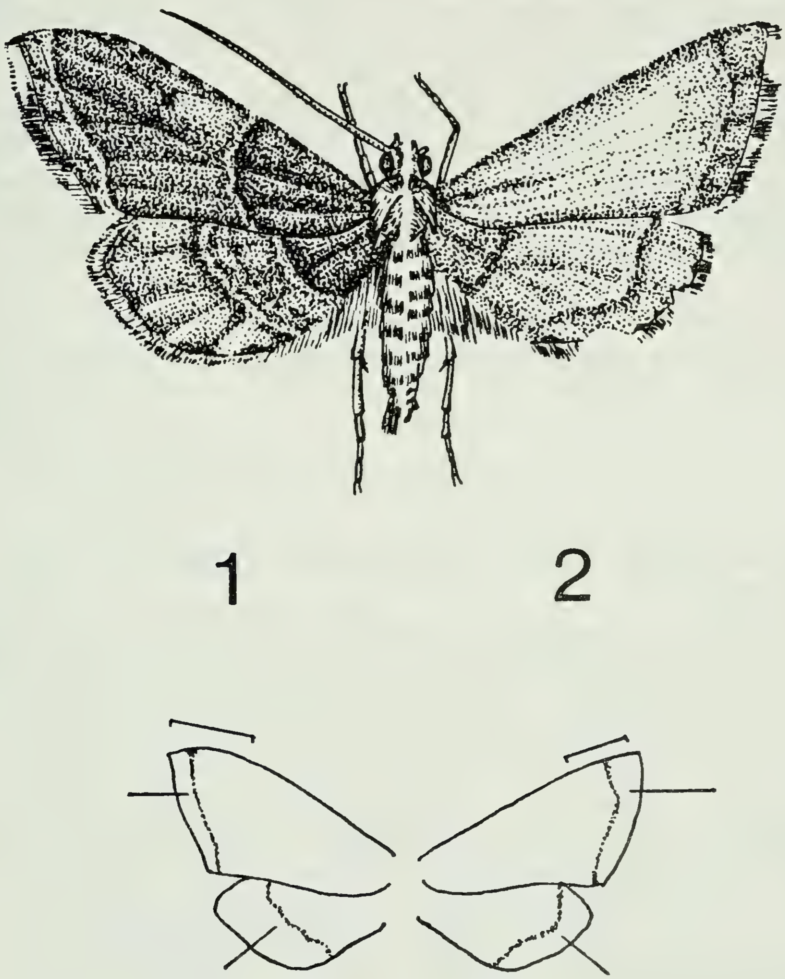

Figure 1. *Endotricha flammealis* D. & S. (Left-hand of figure) (x 4.5)

Figure 2. *Endotricha consobrinalis* Zeller (Right-hand of figure) (x 4.5)

The main differences between the specimen and *E. flammealis* are as follows: The costa is rather straight whereas in *flammealis* it is strongly arched towards the apex. The subterminal line curves away from the termen near the apex, but in *flammealis* it remains virtually parallel with the termen. On the hindwing the postmedian line is strongly arched centrally whereas in *flammealis* it is weakly sinuate. The wingspan of 18mm is slightly less than that of *flammealis* which averages 20mm.

I passed the specimen to A.M. Emmet who took it to the BM(NH) and submitted it to M. Shaffer. Comparison with related species in the general collection showed it to be in all probability *Endotricha consobrinalis* Zeller, a species occurring in Egypt and the eastern Mediterranean region. The specimen is a female and unfortunately the genitalia in this sex do not show conclusive characters for determination; nevertheless, D.J.L. Agassiz made a dissection and agreed that the moth was almost certainly *E. consobrinalis*. The capture is recorded (no. 1424a) in *A field guide to the smaller British Lepidoptera* (Edn 2, 1988).

Presumably the specimen arrived in this country as a pupa. I have been unable to find any information on the cultivation of the celery, its subsequent processing or its relationship with *E. consobrinalis*. *E. flammealis* is somewhat polyphagous and includes decaying leaves in its diet. *E. consobrinalis* may well do the same.

Acknowledgement

My thanks are due to Col. A.M. Emmet and D.J.L. Agassiz for their assistance.

The last British capture of *Scybalicus oblongiusculus* Dej. (Col.: Carabidae)?

THIS very local and rare ground-beetle, only found intermittently at various places on the Dorset coast from Lulworth to the Isle of Portland, is often now supposed to be probably extinct.That may well be the case; I know of no record later than 1915 by F.H. Haines (1917, *Ent. mon. Mag.* **53**: 162), who took two examples under stones at Ringstead, near Weymouth, in April. Yet it may have been found since then and not published, which the following will show to be indeed quite likely. In 1953 a Devonshire collector assured Mr L.S. Whicher that he had, in August 1951, taken *Scybalicus* in some numbers at Portland Bill, and gave him details of the site: at the top of the cliff on the west side of the Bill near the lighthouse, under stones. I made a day-trip to the spot on 30.viii.53, but a thorough search (though it had other pleasing results) revealed no sign of the desired insect. It is a pity that the fortunate captor, apparently, was not moved by the interest of his find to send a note of it to one of the journals; but I see no reason why it should not be genuine. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

BUTTERFLIES OF NEW PROVIDENCE ISLAND, BAHAMAS, A FURTHER REVIEW

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IN 1966 I gave a brief account of the status of the butterflies of New Providence Island, Bahamas, based upon my observations there in 1945 and 1946, and after consulting the collection and relevant literature in the British Museum (West, 1966). However, since that time several excellent textbooks have been published — N. Riley (West Indies), M. Brown and B. Heineman (Jamaica), P. DeVries (Costa Rica) and B. D'Abrera (Neo-Tropical Region) as well as a chaotic, but informative work by M. Barcant on Trinidad and Tobago. In view of this some modifications are needed to my original paper.

Ascia monuste L. is assigned to subspecies *evonima* Bdv. 1836 by N. Riley, and D'Abrera has followed suit, but Brown and Heineman refer to the subspecies found in the Bahamas and the Greater Antilles as *eubotea* Godt. 1819. Of more consequence is the fact that *monuste* is a migratory species, migrations having been noted at locations as far apart as Argentina, Costa Rica and South Carolina, but this species occurs as several fairly well-defined subspecies. For example, my specimens of subspecies *virginia* Godt. from Guadaloupe and type specimens from Trinidad are quite distinct from each other and those from the Bahamas, although I find the latter inseparable from those from Florida. The females of *monuste* are dimorphic; thus Riley mentions the melanic form *phileta* Fab. as being migratory, sometimes spreading from the southern U.S.A. to the Antilles. However, Harris (1972) draws attention to controlled experiments by R. Pease which demonstrate that the capacity to produce melanic females is conferred by a gene, or genes, and that exposure to light for a sufficient length of time is one factor that stimulates dimorphism. Pease also reported that only white females are found in Florida from November through February, while T. Pliske found that a sample of ninety-nine female *monuste* in Florida on July 30th, 1961, comprises 56 melanics, 33 intermediates and 10 whites. My series of *monuste* from New Providence Island was taken in October and November, and it includes two white females; however, in the Collection of the British Museum (Natural History) are two melanic females from the Bahamas, one of which is dated July, the other undated. This is in accord with the findings of R. Pease, but leaves unanswered the question of the origin of the Bahamian melanics; is this form of local origin or are such specimens migrants from the U.S.A.?

Kricogonia lyside Godt. Neither N. Riley nor B. D'Abrera accept *K. castalia* Fab. as a valid species, although Brown and Heineman include both species for Jamaica, giving distinguishing features and quoting at length from Comstock (1944). However, C. Ferris and F. Brown (1981)

state that *K. lyside* is a species over which there has been much confusion due to it being polymorphic, formerly being thought of as comprising two species, *lyside* and *castalia*, but rearing experiments have finally resolved the problem. Riley gives May and June as the time of appearance for *lyside* in the Bahamas; my specimens, all caught in an abandoned garden to the east of Nassau, are dated 3.viii., 18.x., 20.x., 24.x., 3.xi. and 4.xi.1945.

Calisto sibylla Bates is not confined to the Bahamas, it is found also in Cuba where it is subspecifically distinct.

Marpesia petreus Cram. was listed in my previous paper as *M. peleus* Sulz. (an invalid homonym); further, the species has been split into two species — *M. petreus* and *M. eleuchea* Hübn., the insects being quite distinct in appearance. There is a specimen of *M. petreus* in the B.M. Collection from the Bahamas, but not specifically labelled New Providence Island, and should therefore be deleted as a resident of that island, although it is a well known migrant and probably at some time will be noted there. The three *Marpesia* specimens obtained by me 24.xi.1945, 15.xii.1945 and 13.i.1946 are *M. e. bahamensis* Munroe and other subspecies occur in Jamaica and Hispaniola; *eleuchea* thus has a much more restricted range than *petreus* which occurs on the more southerly Caribbean islands and on the mainland from Mexico to Brazil.

Hemiargus hanno filenus Poey. I had this species listed as *H. c. ceraunus* Fab., according to Klots (1960). Riley states that the subspecies *ceraunus* is confined to Jamaica and Hispaniola.

Hemiargus thomasi Clench. I gave the species as *H. ammon thomasi* Clench. Riley accords *thomasi* specific status, with several subspecies ranging from Florida to St. Kitts, excluding Jamaica and Cuba.

Atalopedes carteri Evans. I listed this species as *A. mesogramma carteri*, which I found frequently flying with the very much larger *A. m. mesogramma* Latr.

N. Riley's *Butterflies of the West Indies* will remain an excellent, authoritive work on the region for many years to come; nevertheless regarding the Bahamas several statements in the work are not in accordance with the facts.

Eurema daira Godt. Riley states that this insect occurs as f. *palmira* Poey, having the hindwings white, in the West Indies, exept in Cuba and the Bahamas where the nominate form with yellow hindwings occurs as a casual vagrant; D'Abrera gives the range of the latter subspecies as mainland America from Mexico to Brazil, omitting the Bahamas. I found *daira* commonly on New Providence Island, and possess a score of specimens which exhibit seasonal dimorphism, details of which are given in my previous paper; the colonies seemed very firmly established, yet curiously it is not a species recorded by the Van Voast-American Museum expedition of 1953.

Eurema lisa Bdv. & Leconte. This is another well known migrant of which I was able to discover only one previous record for New Providence Island. I originally listed the insect as subsp. *euterpa* Méné. which Riley considers to be that found in the Antilles, whereas *lisa lisa* is that inhabiting North and Central America. However, he notes that Florida specimens show a tendency to approach *euterpa*, and I do not believe he would have been able to examine Bahamian specimens. The basic difference between the subspecies is that, especially in the male, *euterpa* has very slightly narrower black borders above. My New Providence Island specimens are intermediate in size between those I possess from Chattanooga, Tenn. and some I caught at San Juan, Puerto Rico. The black border of the forewing is considerably wider in the Tennessee specimens compared with those from Puerto Rico, and again the Bahamian insects are intermediate. Regarding this particular difference it would appear that the shape of the forewing black border is slightly more concave in the Puerto Rico specimens, and this causes the border to appear narrower. Thus Riley's comment regarding Florida specimens — nymotypical, but with a tendency towards *euterpa* — would apply to those from the Bahamas also.

Metamorpha stelenes L., *Heliconius charitonius* L. and the Hesperiids *Burca concolor* H-S. and *Panoquina panoquinoides* Skinner are also omitted as Bahamian species by Riley, nor were they found by the Van Voast-Museum expedition in 1952-3. It is interesting to observe that *P. panoquinoides* is regarded as a probable recent arrival in Jamaica, being seen there for the first time in 1947, although it had been found before that time not uncommonly in the Cayman Islands. The Hesperiid *Nyctelius nyctelius* Latr. on the other hand is described by Riley as being distributed throughout the West Indies and generally common; I can find no evidence of its presence in the Bahamas, and on New Providence Island in particular.

The total number of species for New Providence Island is raised by one to fifty-four. Undoubtedly several other species will be discovered on the island, and indeed may well have been observed there already, but cannot be included because preserved specimens in museums lack sufficiently accurate and specific data. I listed two species as Bahamian endemics; this figure is reduced to one — *Eurema chamberlaini* Butl. with several subspecies localised within certain islands of the group.

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A note of the life-history of *Apion soror* Rey (Col.: Apionidae).

Apion soror Rey (=*foveatoscutellatum* Wagner) was first recognised as a British insect by our friend Mr J.A. Parry who found specimens on marsh mallow (*Althaea officinalis* L.) at Burham Marshes in Kent in July 1983. Morris and Péricart (1988 *Bull. Soc. ent. Fr.* **92**, 221-223) state that the beetle is known only from this host-plant in Britain and France but give no details of its life-history.

On 7.ix.1986 one of us (J.A.O.) found a site near Lydd, Kent where the beetle was not uncommon on *Althaea* plants growing at the edge of a wide drain. On visiting the site, on 28.vii.1988, we found a few adults on the plants but we also noted small brown discolorations on the stems, two or three per stem 10 - 15 cm apart. Opening a stem at the point of discoloration, revealed either a whitish grub or a pupa. We cut off some stems at their bases and took them home where they were kept in two ways. Some were cut into sections and kept in polythene bags. Others were placed in jars of water.

Several weevils emerged from the cut sections in August. Others were found on cutting open the stems dead in their pupal cells, perhaps because they were unable to bore through the cuticle of the stem which had hardened considerably since collection; the weevils which successfully emerged probably came out from the cut ends. At the end of August, nothing had emerged from the stems standing in water. On sectioning them, however, two dead weevils were found inside the stem opposite discoloured points and these proved to be male *A. soror*. On opening up some of the stems, larval borings were found in the main stems from near the bases into the flowering spikes. There were signs that the weevil larvae had tunnelled along about 8 cm of stem.

These limited observations indicate that *A. soror* breeds in the stems of *Althaea officinalis* in much the same way as *A. radiolus* (Marsham) breeds in the stems of *Althaea rosea* Cav. (garden hollyhock) and of *Malva* spp. To date, the weevil has been found in Britain only at Burham Marshes and Lydd in Kent, and at Camber in Sussex (M.G. Morris) but *A. officinalis* is recorded (Perring & Walters, *Atlas of the British Flora,* Botanical Society of the British Isles, 1976) at a number of localities near the coast from the Wash round to Lancashire and also in south-west Ireland, which gives scope for further sites to be found.

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A BRIEF HISTORY OF *CARABUS INTRICATUS* L. (COL.: CARABIDAE) IN BRITAIN, WITH SPECIAL REFERENCE TO ITS PRESENT-DAY STATUS

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THIS grand *Carabus*, at about 32 mm in maximum length the largest ground-beetle to be found in this country and one of the most restricted and rare of our indigenous species, used to be taken — mostly by ones or twos but occasionally in fair numbers — in what Fowler (1877: 7) described as "the south-west district bordering on Dartmoor in Devonshire". The first capture was in the Tavy Valley by Dr Leach, as mentioned by Fowler & Donisthorpe (1913), but the year is not stated. Localities cited in the early literature includes Tavistock, Holdsworthy, Ashburton, Bickleigh Vale, Ivybridge and Aller Bridge near Newton Abbot; and the habitat, in woods under moss and lichens on old trunks and stumps, and (less often perhaps) under stones, logs and loose bark, or running in the open. Many of the specimens in our collections originate from J. Reading of Plymouth, who is said to have taken some 70 examples about the middle decades of last century. Very near its end (28.v.1898) a better-known coleopterist of that town, the late J.H. Keys, after years of searching rediscovered the species in the old locality at Bickleigh Vale near Plymouth — a pair from moss on an oak (Keys, 1899). Of my own pair, one (a fine female) is labelled as from Dartmoor (J.B. Wieldt) without date; while the male taken by Reading is marked simply "Devonshire/Nov. 1857".

After Keys' capture, *C. intricatus* appears to have become exceedingly scarce for just half a century. Whether this was due to over-collecting in the past, or to some natural cause such as periodic fluctuation in numbers, can only be guessed — probably the latter. Though there may well have been a few, I have seen no published record for the whole of that time, and have heard of only a single capture: G.H. Ashe in 1947 informed me that the beetle had last been taken by the late Stanley Kemp at lepidopterists' "sugar" on a tree at night in the vicinity of Horrabridge, near Tavistock. This would have been, at a guess, during the 1920s or 30s (possibly later), and probably never reached the pages of a major journal. It is no wonder, then, if more than a few coleopterists have, in the continued absence of published records, concluded that this fine species is extinct here — or almost so.

Happily, however, that is far from being the case; indeed, it evidently survives in good numbers and over an appreciably enlarged territory. The contrast between this and its apparent extreme rarity during the first half of the century (though there was no lack of energetic collectors) is truly remarkable and may indicate considerable powers of revival. The occurrences reported below are very likely not the only ones but merely

those which happen to have come under my notice, and are far too interesting to remain unpublished for much longer. For obvious reasons, it would seem unwise to specify localities too closely; they are, I understand, known to the Nature Conservancy Council and to Dr M.L. Luff.

In December 1960, Mr R.O.S. Clarke had the good fortune to turn up as many as 28 specimens of *C. intricatus*, in two batches of 14 each, under beech bark in a wood in the Exeter district — a part of S. Devon from which there seems to be no earlier record, that from Newton Abbot being the nearest. This highly notable find suggests that the species tends to congregate for hibernation, though of more solitary habit at other times of year. I must add that when Prof. J.A. Owen visited the site recently, the wood was being thinned out; which, unless strictly controlled, may bode ill for the survival there of this Red Data Book Category I species.

Next, a new county record, the first certain one outside Devon (apart, of course, from casual importations). This is for two localities in East Cornwall, the beetle having been taken in 1972 by the late K.C. Side near Lostwithiel, and also near Bodmin — both, I believe, single specimens. This westward extension of the range of *C. intricatus* as previously known, if not great, is still very noteworthy. Any *natural* spread of a flightless insect without special means of dispersal can only be extremely slow, and so any *apparent* spread will nearly always be, in fact, a new discovery of an old site, unless due to human agency.

Finally, Mr T.M. Eccles kindly furnished me with details of his recent experience of *intricatus* in a new Devonshire locality in the "old" area — a wood, fortunately a National Nature Reserve, in the region just south of Dartmoor. Here, in May 1985, on a warm and humid day after heavy rain, he met with six examples "crawling about actively on exposed moss-covered logs and boles of trees, two of them several feet above the ground on tree trunks." One was ascending and another descending a trunk, and a third was in the act of devouring a large black slug on a mossy fallen tree. This encounter too is of great interest, not least for the light it sheds on the insect's daytime habits, though we are agreed that such diurnal activity is likely to be exceptional and correlated with the unusual state of the weather at the time. This notion is supported by the fact that on a second visit to the wood by Mr Eccles in the summer of 1986, in more ordinary weather conditions, no further specimen of the beetle could be found. However, two fully grown larvae occurred in a rotten log lying on the ground, which may well be the first certain find of the larva of *Carabus intricatus* in Britain. (On the characters of this larva, see Fowler, 1887: 6.) It points to a probable autumn emergence of adults, though, apart from the midwinter occurrence above, most appear to have been taken in spring or early summer.

During the early 1950s there were one or two unconfirmed reports of this species in the Highlands of Scotland. Should they have any basis in fact, I suggest the possibility that stocks of German timber, of which a large

amount was imported into Scotland just after the war, may have been responsible. If the beetle were a native of that country (which seems most unlikely), or if such chance introductions had resulted in colonization, it could hardly have been passed over in the course of the intensive collecting that has been carried on in the Highlands in the past 40 years. One such record, however, is certainly due to a misreading (as the author himself informed me): Ashe (1952) wrote that *C. intricatus* was "common among pine trimmings" at Nethy Bridge. This was, I believe, corrected later to *C. violaceus*, but it may be as well to mention it here in case the correction should be missed.

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***Jodia croceago* D. & S., the Orange Upperwing, (Lep.: Noctuidae) in Cornwall and France**

MY FIRST experience of this lovely moth was a perfect male that came to m.v. light in the garden of my house in Cornwall on 4.iii.1983. The house was in a warm, sheltered valley surrounded by oak trees, mainly *Quercus petraea*, including shrubby specimens that retained their leaves throughout the winter. *Croceago* overwinters as a moth, possibly hiding amongst withered oak leaves still on the branch. Despite several years trapping, this single male is the only specimen I have seen in Cornwall. There are only two published records since 1950, both relating to captures by Col. Rossel in the thickly wooded valley of the river Fowey, in the autumn of 1962 (Smith, F.H.N. 1984. *A list of the butterflies and moths recorded in Cornwall, 1950-1983*. Cornwall Trust for Nature Conservation). The moth is also known to occur on the edges of Dartmoor.

Travelling in France near Cahors in 1985, I came across an extensive wood, in a sheltered valley, near Orniac, just south of the D653 Cahors-Figeac Road. The wood contained shrubby trees still retaining their leaves. I immediately thought of *croceago* and beat the branches of a small tree by the side of the road and at once obtained a female *croceago*. No more moths were obtained by beating, so I returned at night with an m.v. lamp. I obtained four males which were flying about one hour after dark (20.30), but no more were seen despite running the light until after midnight.

The female was placed in a box with a small piece of pear as food, and she started laying the following week (Heath, *The moths and butterflies of*

Great Britain and Ireland, **10**, advises the provision of oak twigs for egg-laying by captive females). At first the ova were yellowish-green, turning to red-brown after six days. They started to hatch on 2nd May, when the mother was still laying eggs. In their first instar, the larvae were grey-brown with black hairs, with light brown heads, and the first three and last two segments were a blue-grey colour. The mother died on 12th May, having laid 365 eggs, by which time the many larvae were into their second instar and had lost the darker area near their heads. The larvae were very restless, and very good at escaping from their cage. Some were given to various friends, who passed them on, and many were eventually bred by collectors in other parts of Britain perhaps under the mistaken impression that they were of Cornish origin. — A. SPALDING, Tregarne, Cusgarne, Truro, Cornwall.

Cryptopleurum crenatum **Panz. (Col.: Hydrophilidae) in West Kent and Herefordshire.**

First detected here in 1938, this remains a scarce species which, however, may well prove generally distributed over England at least, as the rather few published records suggest. An idea of its incidence compared with the common *C. minutum* F. is given by the fact that C.E. Tottenham, writing in 1939, found only three *crenatum* among nearly 200 *minutum* in his own and R.W. Lloyd's collections (*Ent. mon. Mag.* **75**: 117). The records I have seen are from Middlesex, S. Essex, Surrey, N. and S. Hants, Oxon, Worcs, M.W. Yorks and Scilly. In addition, I have lately determined an example from my former garden at Blackheath, W. Kent, probably from compost (viii.55); and had previously extracted two from flood-refuse from the River Wye at Hereford (ii.1948). Contrary to custom, the author of *crenatum* is given as Kugelann in the 1977 Check List — on the correctness of which change I venture no opinion. Our third and more recently added *Cryptopleurum, subtile* Sharp, is little recorded but continues to occur here at m.v. light sporadically, and I have found it in siftings from a straw-stack not far away. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

Phyllonorycter messaniella **Zell. (Lep.: Gracillariidae) feeding on** ***Quercus borealis*****, the red oak.**

WHILE collecting leaf mines from Colwick Country Park, Nottingham, on 4 September 1988 I came across a tenanted mine on a leaf of *Quercus borealis*. A specimen of *Phyllonorycter messaniella* emerged ten days later. Whilst *messaniella* is well known for feeding on a wide range of trees, especially *Quercus ilex* and other deciduous *Quercus* species, it is perhaps worth recording which individual oak species are used. — A.S. BOOT, 38 Balmoral Road, Colwick, Nottingham NG4 2GD.

BUTTERFLIES IN WINTER

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TOWARDS the end of Gilbert White's The Natural History of Selborne, a comparative calendar sets out various dates for first and last appearance as recorded by White in Hampshire, and Marwick in Sussex; they include 13th February and 24th December for the Brimstone, and the same first date for the Peacock with the last date of Christmas Day. Nothing for January at all, for these two acute observers. As a result of a ten year study, in this article, I hope to suggest that they could have seen more! "Winter" is taken to include the four months of November to February.

A Winter Experience.

It is mid-day on 5 December 1984. The weather is perfect, apart from a gentle cool breeze. The location is an estate yard serving a 16th century mansion; on three sides are ranges of stables and workshops, the fourth side being taken up by the timber store, a charming open-fronted building, the ancient granite piers supporting a slate roof mellowed with grey and orange lichens. All is quiet; The Estate Staff have dispersed to their homes for lunch, and the Agent has settled in his car with coffee and sandwiches, facing with anticipation, the sunny timber store where hyper-active wrens and robins dart in and out of the shadows. A scrutiny of the roof reveals a Small Tortoiseshell basking, wings flat, as a grey squirrel ripples through the trees above. At 12.04, a Red Admiral arrives, making straight for an old white-enamelled cylinder to bask. Six minutes later, a small male Red Admiral appears, settling to bask upon a granite block two metres from the female; both allow very close approach. The Small Tortoiseshell, in the meantime, makes periodic flights between the roof and various walls, showing preference for the former. At 12.40, both Red Admirals take wing and toy. There follows a prolonged pursuit, the female casually wandering high in and around the trees, and down around the yard, constantly followed by the male. Twice she settles, the male attempting to mate with her. Her final flight is on to a branch in the shade, some twenty feet up, and here, the male is successful, after much fluttering, and the pair become motionless.

I am vaguely aware, by dint of artificial coughs, that the men have returned, and imagine knowing exchanges of grins or even worse, but my binoculars are not lowered! The sunlight reaches the paired butterflies, but they do not move. At 12.51, a fine Peacock passes close to the Red Admirals, coming out of the dark wood to settle upon a granite block; this butterfly clearly hesitated when passing the pair, obviously aware of their presence. Clouds begin to increase, the sun becoming more hazy, but at 13.01, a third Red Admiral flies into the yard to alight on the white cylinder. The Peacock now flights, and enters the dark recess of the

woodshed, but moments later, reappears to join the Small Tortoiseshell upon the roof. At 13.10, a fourth Red Admiral flies in, immediately toying with number three. They even almost settle on the same branch as the first pair, but eventually separate, one departing, and the other flying into the depths of the wood.

It is 13.20 when a second Peacock glides into the yard, and after some procrastination, joins the two butterflies on the woodstore roof. By 13.32, it is overcast, when the first Peacock suddenly closes its wings, shortly afterwards taking flight to investigate pedantically, various options to hibernate in roofs, ivy etc, before departing at 13.38. The second Peacock abruptly closes its wings at 13.44, then flies high into the trees, down again, settles to bask at various spots, and eventually departs into the wood. In the meantime, the Small Tortoiseshell has been basking on the roof for an hour and a half, only making fractional pivot movements, and seeming indifferent to the cloudy conditions, or the fact that the sun would have left this spot for half an hour anyway. At 13.55, the butterfly closes its wings, but at 14.05, basks again, this time briefly, before departing into the wood; I return at 15.15 to check upon the paired Red Admirals, noting that they are still *in cop*, although the male is now at a slight angle.

Breeding

I have fairly frequently watched Red Admirals prospecting nettles during November, but only once, on 7th November 1983, seen eggs actually being laid. These started to hatch on 17th November. By Christmas Day, three larvae still survived in their individual "tents", two being half-grown, and the third, smaller, appeared to be hibernating. A farmer unfortunately trimmed the nettles. From a "control" egg of the "batch", a small female emerged on 21 January 1984; although reared in an unheated room, the control larva was always ahead of those in the wild state.

On 25th December 1987, I watched two Painted Lady butterflies frequently toying along the sunny verge of a wood where, in a previous year, I had established that one was returning to "hibernate" after sorties to flowery fields on sunny mornings. (Ent. Rec. **92**: 87.)

Feeding

The very hardy Red Admiral will continue to feed throughout November in the most severe of conditions, if sunny (*Ent. Rec.* **90**: 63-64), but thereafter, they appear to lose interest, my latest date being 1st December on chrysanthemums. Both observations showed that the individual returned daily to the chosen food source. In March, pussy willows are attractive. The Painted Lady on the other hand, feeds at any time; I have notes for garden marigold, yellow buddleia, and dandelion.

Small Tortoiseshells and Peacocks seem to be uninterested in flowers before the first really spring-like day; In spite of numerous observations, the earliest and latest dates for Small Tortoiseshells feeding are 16th

February, and 2nd December (red valerian), and no record for the Peacock during any of the four months. However, on several occasions during January, I have observed Peacocks drinking moisture. (*Ent. Rec.* **90**: 64.) Small Coppers feed from yellow flowers throughout their flight period, often into November, my latest date being the 10th.

Species

My latest dates for "summer" butterflies are:- Speckled Wood, 12th November; Meadow Brown, 2nd November; Small White, 10th November; Clouded Yellow, 8th November; and Small Copper, 10th November. Here in the South-West, one would reasonably expect to see a November Small Copper in three-brood years, and also the Speckled Wood if searched for diligently.

Weather Conditions

With practice, one tends to aquire a sense of recognising the subtle difference between the negative and the promising day. Sometimes, it seems quite illogical. For example, three patrols along a mile of good habitat during December on fine sunny days, produced nothing, three Small Tortoiseshells, and one Peacock respectively. A touch of damp rawness seems to be the inhibiting factor. Temperatures far below what might be expected, are tolerated. I frequently see basking butterflies when the shade temperature is in the low forties Fahrenheit even after frost, with that frost unthawed in the nearby shade, and on 30 January 1987, a Peacock was basking amongst the rubble of a wall in a bitter east wind which buffeted its wings; the shade temperature was below 38° F., and the wind strong enough for flags to snake vigorously. An early sunny start to the day seems helpful, but not essential, and good sunny periods will suffice.

Habits

The Peacock is probably the most lured out of the winter butterflies, and on the whole, is the most stable in relation to the hibernation base. Might it be that the propensity to seek moisture is due to the dryness of preferred shelter? In very marginal weather conditions, the Peacock will merely crawl to a sunny nook of micro-climate; here, they are extremely difficult to see unless one looks right into the situation, and are ultra-coy, shutting wings at the slightest disturbance, so it is essential to see first! I am convinced that the Peacock is a sporting insect (Ent. Rec. **91**: 212). In common with the Small Tortoiseshell, the species is capable of emerging from dark locations, and flying quite considerable distances to a sunny area. On 8 January 1978 a Peacock was flighting and sunning in a patch of dead bracken on an open hillside; as fog crept up the valley, the butterfly purposefully flew off far into the permanent shade on the other side, towards a group of old buildings.

Whilst many Small Tortoiseshells remain loyal to their hibernation site (Ent. Rec. **90**: 271), some are rash in their ventures, becoming confused when leaving the return until too late, and will wander indecisively; one December victim eventually settled under a nettle leaf where it subsequently perished. The Comma will feed on ivy flowers early in November; late and early dates are 15th December and 23rd February. The species may be so reluctant to move because of the high open hibernation stance exposed to stronger, cool breezes etc. One autumn butterfly closed up on the top of a sunlit leaf during the afternoon of a perfect day, and remained motionless throughout the following similar day. Winter appearances of the Brimstone have always been of very brief duration. An interesting puzzle regarding all these species is why, after they have closed down in an apparently ideal position, they will move again after some hours.

Habitat

Allotments with numerous sheds, neglected plots, and scrubby corners are good sites as are along the verges of wood or scrub on a south facing slope, especially if there are old, neglected dry-stone walls and hedge-banks. Emergence time is most often between 1130 and 1300 hours and a constant patrolling is best. Such an ideal site, of about three quarters of a mile, has been used for much of this research, and reveals that only a fraction of the specimens in residence come out on any one day before the first really spring-like day.

Conclusion

It is suggested that almost anywhere in the country will enjoy the conditions required to stimulate hibernating butterflies from time to time; application is certainly required, but success is uplifting! I would by very interested to hear of the position elsewhere, and would happily submit a summary to The Editor. For each month of 1988, at least three different species were sighted, enabling three calendar lists of species per month to be produced without repetition, for twelve months. To complete this, a Brimstone was essential. On 28th December, the last chance, a window of blue sky appeared above a favoured wood, but a watch of one and a half hours was unsuccessful. Walking back to the car, I noticed a sunny scrub-filled ride under some pylons and made my way to it. Standing a few paces from a small bush, there was a fluttering disturbance from its depths, and out fluttered an immaculate male Brimstone at 12.55. The butterfly made two sorties up the ride, and then returned into the bush after a few minutes. I touched my cap to whoever might be in charge above.

MONITORING OF BUTTERFLIES AT ST CYRUS NATIONAL NATURE RESERVE, 1979-1983

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Introduction

POLLARD (1979) describes a method for monitoring the abundance of butterflies by counts of species and individuals along a pre-determined route; the now well-known transect method. Following trials at Monks Wood, a national butterfly monitoring scheme was commenced in 1976. Ten years on, one hundred and sixteen sites have provided data in three or more years (Pollard *et al* 1986), allowing annual calculation of an index of abundance for each species, provision of information on flight periods, some assessment of habitat preference and the possible effects of management through distribution along the transect.

Transect monitoring for this study was carried out annually at St Cyrus from April 1979 to September 1983. Situated some eight kilometres north of Montrose in the county of Kincardineshire (Fig. 1), the ninety hectares of sand dunes and salt-marsh, ungrazed pasture (by stock), gorse scrub, basalt cliffs and slopes (locally heughs) of St Cyrus were declared a National Nature Reserve in 1962, as rich and varied a mix of species and

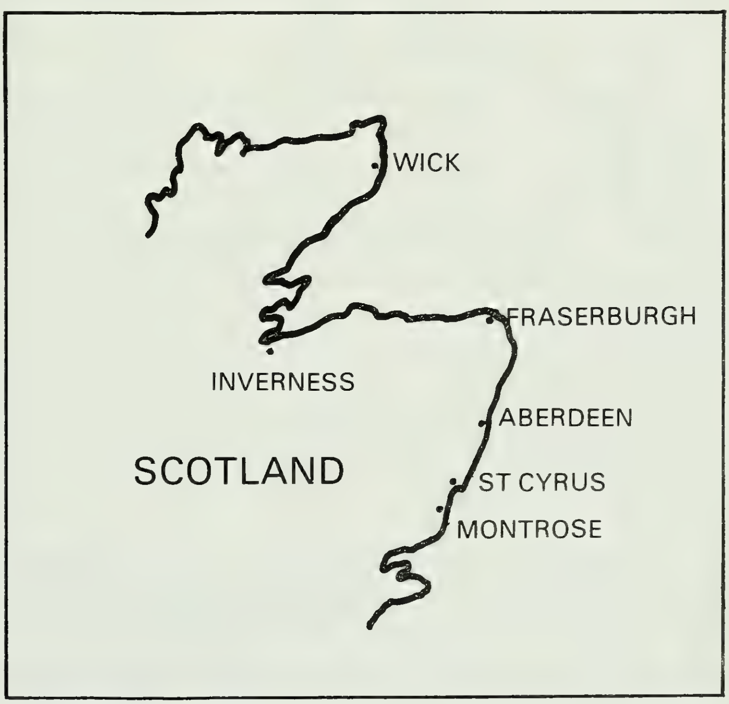

Fig. 1 Location of St Cyrus reserve

habitats as can be found anywhere on the Scottish coast (Fig. 2). Retained in private ownership by two salmon fishing companies, the diversity of habitats has been maintained, even enhanced through a blend of traditional land use practises by the fishermen and management for nature conservation. Coupled with which, St Cyrus has remained undeveloped, a relatively quiet strip of coast spared many of the more extreme recreational and leisure excesses that despoil accessible coastlands everywhere.

Furthermore a combination of local conditions: comparatively mild climate, sheltered and sunny location (over fourteen hundred hours

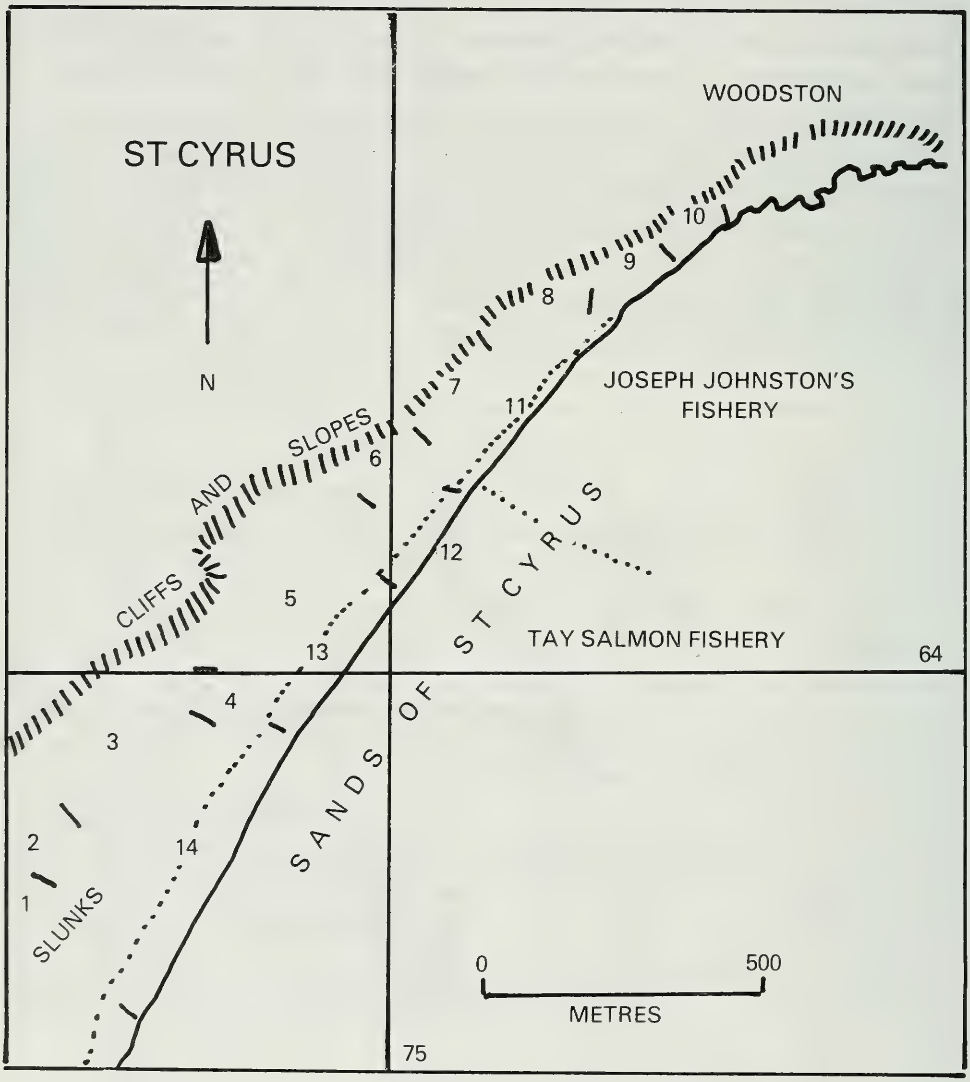

Fig. 2 Detail of reserve showing sampling points 1-14

annually) freely-draining, calcareous soils and low rainfall combine to produce conditions which support a rich and colourful flora of over three hundred and fifty species of wild plant, many confined to the Scottish coast, others at or near the northern limit of their distribution in Britain. Although the flora has been well known for over a century (Dickie 1860), it is only in recent years, notably since the work of Pelham-Clinton, that attention has been given to the Lepidoptera. Of the thirty one species of butterflies occurring in Aberdeenshire and Kincardineshire only twenty are resident; of these thirteen are known from St Cyrus (Palmer and Young 1980).

The Butterflies, Species and Abundance

Transect recording was carried out from the beginning of April until the end of September each year from 1979 to 1983. During the first four years the route comprised ten sections encompassing the principal habitats found on the Reserve. In 1983 the transect was extended to incorporate a line of sand dunes. The study area ranged across a broad spectrum of habitats. From its beginning in a small area of rarely-inundated salt marsh or "slunks" (Scots: slonk, a mire), through rabbit-grazed dune pasture and scattered gorse scrub rich in wild plants (clustered bellflower, maiden pink and meadow saxifrage amongst them), to a more closed grass-dominated community on slopes of blown sand beneath seventy metre basalt cliffs. Finally along an exposed, low-lying sand dune ridge.

Recording was carried out at certain times of day and under suitable weather conditions (e.g. a minimum temperature of 11°C and 60% sunshine along transect). The method followed was as detailed in Pollard (1977). Additionally an assessment of local weather, albeit rather crude, was made throughout the recording period: maximum daily temperature, total days with more than 50% cloud cover, and precipitation, that is the total days on which rain, snow or fog occurred as distinct from dry days.

Sea-fog or "haar" (Old Norse: harr, hoary) a feature of the North Sea coast, was common in the late spring and early summer. A cloying, sunless damp, it had a marked effect on butterfly activity. Even so, weather records showed remarkable consistency, probably more a reflection of the crudity of the recording method than a measure of the local climate. Mean monthly temperatures fluctuated little about a small range and the number of dry days to wet days compared favourably from year to year (see table 1).

Thirteen species were recorded along the transect during the recording period (see table 2), eleven resident and two migrants. Of these, six occurred every year. Green-veined White, Meadow Brown and Small Heath were consistently the most abundant butterflies on the Reserve, a feature probably linked to their wide ranging habitat tolerances as well as, in the case of Green-veined White, local immigration from arable fields flanking the west side of the Reserve where the food plants (wild crucifers)

	APRIL	MAY	JUNE	JULY	AUG	SEPT	% DRY DAYS
1979	NO RECORDS			21	18	17	57
1980	14	18	20	21	20	17	54
1981	13	18	20	22	22	18	62
1982	14	—	21	24	21	16	63
1983	11	13	23	23	24	17	51

Table 1. Mean Monthly Maximum Temperature (°C) 1979 - 1983.

SPECIES	Years Recorded	1979	1980	1981	1982	1983	TOTAL
Meadow Brown	5	46	27	96	486	900	1555
Green-veined White	5	109	112	127	218	116	682
Small Heath	5	39	41	25	86	53	244
Grayling	5	19	12	5	73	41	150
Common Blue	5	12	16	6	63	29	126
Small Copper	5	17	25	11	10	9	72
Small Tortoiseshell	4	11	5	0	34	13	63
Small White	3	12	5	0	30	0	47
Northern Brown Argus	4	0	3	1	16	12	32
Large White	4	3	1	0	13	4	21
Red Admiral	2	0	4	0	2	0	6
Small Blue	2	0	2	1	0	0	3
Painted Lady	1	0	2	0	0	0	2

Table 2. Annual Indices of Abundance 1979 - 1983.

were commonly found. Although Grayling, Common Blue and Small Copper were recorded annually, they were seldom well represented; annual indices rarely exceeding twenty individuals. However, apart from Small Copper and Small Blue, all resident species showed dramatic increases in abundance in 1982, concurring with the National trend, a situation no doubt influenced by the relatively high summer temperatures that year. Both Small White and the more free-ranging Small Tortoiseshell were present in most years. Abundance patterns for the two species were very similar, both species showing dramatic increases in 1982 following periods of decline. Again local immigration from adjacent farmland, where Small Tortoiseshell over-winter in outbuildings, and both species find an abundance of food plants, no doubt had a significant influence upon the numbers of individuals recorded on the Reserve. Similarly Large White,

considered a migrant by some authorities (Thomson 1980) may have numbers boosted by immigration in some years. According to Pollard (1986) however, transect data puts this supposition into some doubt on the basis of two important observations. There is a good correlation between spring and summer generations and seasonal appearance is regular, not erratic as one might expect with a migrant. At St Cyrus Large White were seldom seen in quantity, a mean annual index of only four between 1979 and 1983. Generations were indistinct and seasonal appearance ranged from week twelve (17-23 June) to week fifteen (8-14 July), suggesting that immigration may well have been taking place.

Gunning (1896) was familiar with St Cyrus as a "splendid ground" for the Northern Brown Argus. In 1979 a small colony was located on a stretch of disused railway line adjacent to the Reserve, a few individuals loitering in the vicinity of the foodplant *Helianthemum nummularium.* The following year three were seen on the Reserve and each year thereafter in small but increasing numbers between 1 July and early August.

The only other rare butterfly at St Cyrus also has its centre of activity along a stretch of disused railway line adjacent to the Reserve. Here amid drifts of kidney vetch, growing on open ballast, a discreet colony of Small Blue survives. The butterfly also occurs on the Reserve, and although recorded only twice along the transect during the five years, a tiny satellite colony was found on slipped soil at the sheltered base of a cliff-slope, a typical location for the species in Scotland (Thomson 1980).

The migrants Red Admiral and Painted Lady occurred infrequently and erratically. Red Admiral, the commoner of the two, appeared in only two years, most frequently at the end of summer. Painted Lady was recorded only once, in 1980 when over twenty flew in off the sea in late June and on a few subsequent dates that season, a particularly good year for the species in Britain.

Distribution along the transect: occurrence by section

Table 3 shows the mean number of individuals recorded in each section for the five year period. Figures are calculated to the nearest whole number. Where insufficient data allows this, species' presence is indicated thus *. Numerical data for sections eleven to fourteen are omitted as this extension to the transect was only made in 1983, the last year of the present study.

Not unexpectedly, the three most abundant species: Meadow Brown, Green-veined White and Small Heath were also the most widely distributed, occurring in all sections. By contrast the Small Blue was only found in two sections (14% of the transect), confined to within a few metres of its larval foodplant, kidney vetch (*Anthyllis vulneraria*). Northern Brown Argus showed a similar pattern occurring in only five sections at the northern end of the Reserve. The obvious association is with its larval foodplant, rock rose (*Helianthemum nummularium*), although at

SPECIES	SECTION (See Fig. 2) 1	2	3	4	5	6	7	8	9	10	11	12	13	14
HABITAT	S	P	P	P	P	G	G	G	G	G	D	D	D	D
Meadow Brown	1	2	1	2	25	20	20	25	90	18	*	*	*	*
Green-veined White	7	30	12	3	6	5	9	8	15	10	*	*	*	*
Small Heath	4	1	2	1	10	3	3	2	7	2	*	*	*	*
Grayling					2	2	20	15	45	41		*	*	
Common Blue		2	3		4	3	8	17	32	18				
Small Copper		5	3		7		3	13	24	10				
Small Tortoiseshell	*	1	*		1	*	1	2	3	2	*	*	*	*
Small White	*	1	1	1	1		1	1	3	1				
Northern Brown Argus						2	7	1	15	2				
Large White		1	1	1			1		1	1				
Small Blue							*			*				
TOTAL SPECIES	5	8	8	5	8	7	11	9	10	11				
TOTAL INDIVIDUALS	12	43	23	8	56	46	73	84	235	105				

HABITATS
S = Saltmarsh
P = Dune pasture
G = Cliff slope grassland
D = Sand dunes

Table 3. Mean number of individuals/section 1979 - 1983.

St Cyrus where the plant occurs rather sparingly, it is interesting to consider the observation by Thomson (1980) from the Durham coast. There, in the absence of rock rose, larvae feed on bloody cranesbill (*Geranium sanguineum*), a frequently occurring plant among the cliff-slope grasslands at the northern end of the Reserve.

Most species however, were recorded along most of the transect, only the inconsistent Large White and the locally rare Northern Brown Argus and Small Blue being found in under half the fourteen sections. Generally the more sheltered, botanically varied sections yielded the most species, while the exposed and more uniform areas (sand dunes, upper salt marsh) produced fewer species. Within the richer dune pasture and cliff-slope grasslands there were further differences. At the northern end of the transect (sections 7 - 10), a rather closed grass-dominated community on sunny slopes of windblown sand, the mean number of species/section was ten. This contrasted with seven species/section recorded from sections 2 -6 at the southern end of the transect, a mixture of rabbit-grazed dune pasture and dense gorse (*Ulex europaeus*) scrub.

Similarly some species were recorded more frequently in some sections than in others. Given that transects were carried out only once a week and that little obvious variance in numbers of species and individuals occurs between sections of differing lengths (e.g. secton 9 is less than one hundred metres long), it would appear that some sections are particularly favoured by some species. For example Green-veined White appeared to favour section two. Meadow Brown were found most abundantly in section nine, as were Grayling, Northern Brown Argus and Common Blue.

Occurrence by weeks

Figure 3 shows the averaged flight periods of the eleven resident butterflies for the period 1979 to 1983. Peak periods are indicated thus ' ● ' and where generations were distinct, a break in the horizontal axis is shown.

Butterflies were present from week two (8 - 14 April) until the end of transect recording on 29 September, though records of Small Tortoiseshell and the migrant Red Admiral into mid October were not unusual. The total number of species present each month ranged from three in April to five in September, peaking at eleven during July. The optimum period for butterfly activity (maximum numbers of species and individuals) was from 22 July to 4 August.

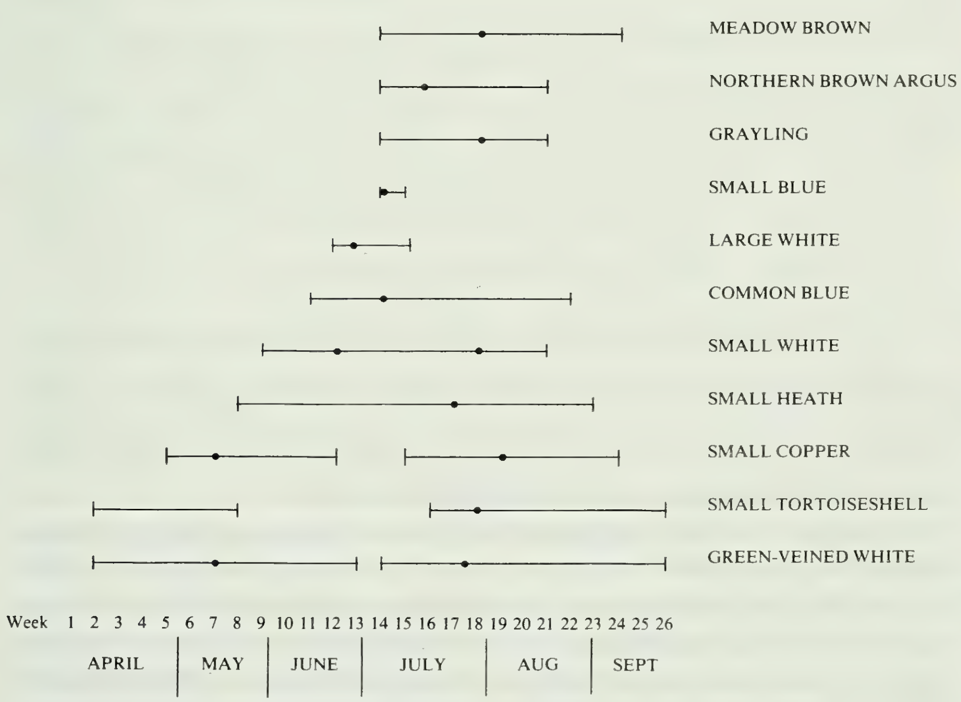

Figure 3 Averaged Flight Periods 1979 - 1983 by weeks

Only Small Copper, Small Tortoiseshell and Green-veined White produced two distinct generations each year.

The univoltine species: Small White, Meadow Brown, Common Blue and Small Heath all showed protracted flight periods. By contrast, Small Blue, Grayling and Northern Brown Argus were on the wing for relatively short periods.

Discussion

Excluding the migrants Red Admiral and Painted Lady, eleven species occurred regularly along the transect. This compares favourably with neighbouring coastal sites: Sands of Forvie (60 km north) with ten species, and Tentsmuir (53 km south) with thirteen (Pollard 1986). But for the locally uncommon Small Blue and Northern Brown Argus, and the confined Grayling (almost exclusively coastal in Scotland), the St Cyrus fauna might be regarded as unexceptional; all the species being both common and widely distributed. Even so, the distribution of species by section showed interesting differences between one end of the transect and the other. Reference to Table 3 shows sections 7 to 10 recording more species and greater numbers of individuals than the southern sections 1 to 6. The clue as to why this should be may be linked to traditional land use.

At least since the 13th century, salmon fishing has been carried out at St Cyrus (Fraser 1979). Fish, returning each year to their native river north Esk to spawn, are caught by elaborate lines of stake nets extending seawards at right angles to the shore. Two salmon fishing companies own the land comprising the Reserve: Tay salmon company and Joseph Johnstons of Montrose. The land, like the fishing has been managed traditionally; the south end (sections 1 to 6) by Tay salmon company, the north (sections 7 to 10) by Joseph Johnstons. Important differences have arisen. The north end of the Reserve has been more intensively managed: steep cliff paths have required regular maintenance and clearance of encroaching vegetation to allow unimpeded access by the fishermen, particularly at night. The limited areas for net-drying and pole storage has required the control of invasive scrub and rank vegetation. Similarly "cool burning" of the cliff slopes is carried out in winter to reduce the likelihood of more serious fires during the summer when dry litter from previous years produces "hot burning" (pers. comm. J. Ritchie).

By contrast the more extensive Tay salmon company has pockets of undisturbed, even rank vegetation, notably mature gorse scrub and tall grasses. Because road access is possible at the south end of the Reserve, there has been no requirement for the creation of cliff paths. The cliff slopes too have been largely left, their bracken-dominated flora probably less at risk of serious summer fire than the arid slopes at the north end of the Reserve.

Since declaration of the Reserve in 1962, a balance has been sought between conservation management and the day to day land use practises associated with salmon fishing. The resulting compromise has helped retain a mosaic of habitats, some disturbed, others neglected. Although the majority of butterflies recorded might be regarded as unspecialised, it is suggested that traditional land use characterised by periodic, low-intensity disturbance, coupled with the retention of non-intervention areas, produces a range of conditions favourable to their survival.

Acknowledgements

For assistance in the field I am indebted to: J. Beaton, T. and E. Bushby, P. Carstairs, C. Crick, the late P.Hancock and G. Pierce. For stimulating and good natured discussion on management and land use history, I thank the St Cyrus fishermen, particularly J. Ritchie, F. Taylor and J. Dodds.

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"Swarming" in Scarabaeidae (Col.) at Bedruthan Steps, Cornwall

During a family holiday in April 1988 we paused to picnic on the cliff tops at Bedruthan Steps. Soon after sitting down near the precipice it became obvious that large numbers of Scarabs were on the wing and being carried out to sea by the easterly breeze (Force 3 - 4 according to the shipping report). As always seems to be the case, nets and tubes were not at hand, but sufficient beetles were falling about our sandwiches for identification to be made. *Aphodius fimetarius* (L.), *Aphodius ater* (DeGeer) and *Aphodius prodromus* (Brahm) were found to form at least the major part of the swarm.

Estimation suggests that along a six metre stretch of cliff 30 - 50 individuals flew, or were blown out to sea every minute. This being in a

band between approximately one metre and two metres off the ground. Others were flying higher and a few lower but not at the same density. A post-prandial stroll along the cliff top to the West and East demonstrated that the same was occurring along at least a one km stretch of coastline: possibly more, but time did not allow further exploration. There was no indication of when events started but they certainly continued for the full duration of our one hour stay and showed no sign of abating as we left. Quick calculations suggest that some 400,000 individuals may have been swept out to sea where the sea-birds were feeding upon them "on the wing". The area immediately behind the cliff showed signs of sheep grazing with old dung present (but not inhabited) and behind this fields contained a fairly high density of cattle. — N. ONSLOW, 1 Windmill Close, Willesborough, Ashford, Kent TN24 0AU.

A third mainland example of *Thera cupressata* Geyer (Lep.: Geometridae)

A MALE example of *Thera cupressata* was taken in my garden m.v. trap, at St Ives near Ringwood, on the night of 24/25th October 1988. A male *Palpita unionalis* Hübn. was also taken that night. Initially the specimen was misidentified as an aberration of *Thera juniperata* L. but on removal from the setting board it was clearly not of that species and corresponded exactly with the two specimens illustrated in the literature (*Ent. Rec.* **98**: 217 and *Proc. Trans. Br. ent. nat. Hist. Soc.* **20**: Plate IV, opposite p 74 — the latter illustration being in colour).

The published British mainland records are as follows:

(a) 1.xi.1984, at Walberton, West Sussex (*Ent. Rec.* **100**: 180)
(b) 22.x.1988, at Studland, Dorset (*Ent. Rec.* **101**: 24)
(c) 24.x.1988, at St Ives, Hants, here reported.

The history of the spread of *Lithophane leautieri* Boisd. is well documented, and it is now one of the commonest late autumn moths in some areas (including Ringwood, Hants). It does seem premature to speculate that the establishment of another *Cupressus* feeding species is imminent on the basis of so few sightings, but the capture of two males on Guernsey in October 1985 (*Ent. Rec.* **89**: 217) was followed by the discovery of feral larvae on *Cupressus* the following year, and the species is now breeding on Alderney (*Proc. Trans. Br. ent. nat. Hist. Soc.* **20**: 44). The current status of *cupressata* in the Channel Isles has been recently summarised by Costen (*Ent. Rec.* **101**: 86).

All of the mainland records are associated with species of known migratory tendencies and there is little evidence to suggest that it is already established here; however it is worthy of note that both *leautieri* and its foodplants are well established both at Studland and Ringwood.

My thanks are due to Bernard Skinner for confirming the identity of my specimen. — Dr JULIAN CLARKE, 11 Sandy Lane, St Ives, Ringwood, Hants.

LEPIDOPTERA IMMIGRANT TO THE BRITISH ISLES IN 1985, 1986 AND 1987 — A SUPPLEMENTARY NOTE

R.F. BRETHERTON[1] AND J.M. CHALMERS-HUNT[2]

[1] *Folly Hill, Birtley Green, Bramley, Guildford, Surrey.*

[2] *1 Hardcourts Close, West Wickham, Kent.*

THIS report summarises the additions and corrections to the records of immigrant Lepidoptera made since the publication of the original reports and supplements. All reports were made in the *Entomologist's Record and Journal of Variation* as follows:

for 1985 — **98**: 159-163; 204-207; 223-230 with supplement in **99**: 147-152
for 1986 — **99**: 189-194; 245-250
for 1987 — **100**: 175-180; 226-232

1985

Corrections to Annexe II: For *Euchromius ocellea* Haw. Winchester, 4.4 read J.C. Wells instead of J.Wild. *Heliothis peltigera* D. & S. for Oxon. read Berks, v.c.22.

Additions to Annexe II:

Sitochroa palealis* D. & S. KENT W, East Malling, 1.8, 21.8 (R.A. Chambers, *Ent. Rec.* **98: 256).

**Ostrinia nubilalis* Hübn. DEVON Axminster, 8.10, probably immigrant (ECP-C).

Lampides boeticus L. DORSET Portland Bill, 5.9, two, 21.9 (M. Rogers per NFM).

Agrius convolvuli L. BERKS. v.c.22 Fernham, 15.9, 16.9.

Hyles lineata livornica Esp. NORFOLK E. Winterton-on-Sea, 12.4 (D. Hipperson, Norfolk Moth Survey). SOMERSET S. Over Stratton, c.6.6, originally reported as *Hyles celerio*, later corrected by RFB (P. Nelmes per E.T. Levy). CO. TYRONE. Ballymagorry, 30.4, in poor condition (RFH in *INJ* **22**: 113). WILTS N. Ashton Keynes, 18.4 (A.K. Bowley, *Ent. Gaz.* **37**: 16).

Thaumetopea processionea L. CHANNEL ISLANDS Jersey, 10.9, male, 2.9, female, in Rothamsted trap. Now possibly established (A.D. Riley, *Ent. Rec.* **99**: 225).

Cyclophora puppillaria Hübn. BERKS. Fernham, 18.9, two, 24.9, 26.9 (S. Nash). NORFOLK E. Winterton-on-Sea, 10.10 (P. Hipperson. Norfolk Moth Survey).

Rhodometra sacraria L. SOMERSET S. Crewkerne, 11.10, three (J. Reid, *Ent. Gaz.* **37**: 90). CAERNS. Bangor, 1.8 (M.J. Morgan, *Ent. Gaz.* **38**: 140). ABERDEEN S. Kirkhill Forest, October, one (M. Townsend per Palmer, R.M. and Young, M.R. *Ent. Rec.* **99**: 113).

Thera cupressata Geyer CHANNEL ISLANDS Guernsey, St Peter's, 17.10 and 19.10, at light (P.D.M. Costen and T.N.D. Peet, *Ent. Rec.* **98**: 217-218, with figure). It was found there again in 1986 and also in Alderney: probably now established. On the British mainland a specimen taken at Walberton, Sussex W. 1.11.1984 has since been found (C.R. Pratt, *Ent. Rec.* **100**: 180).

Mythimna vitellina Hübn. DEVON S. Axminster, 8.10 (EC-PC).

Mythimna unipuncta Haw. SURREY Wimbledon, 1.10 (Sir John Dacie in Plant, C.W.P., *London Naturalist* **65**: 27). CO. CORK MID, September, October, two (RFH in *INJ* **22**: 113).

Catocala fraxini L. DORSET/HANTS BORDER Avon Forest Park, 12.9 (G.F. Le Pard, *Bull. amat. Ent. Soc.* 1987 **46**: 121).

These additions together with those in the first Supplement include additional species which are wholly immigrant, raising the total for 1985 to 36.

1986

Corrections: Vol.99 p.192 line 7 down, after "noted at", insert "Hampstead, Middlesex, 20.5(RAS) later at". P.247 line 18 down, for "Cambell" read "Campbell"; lines 15 down and 4 up, for "CUMBRIA" read "WESTMORLAND v.c.69"; line 6 up, for "v.c.16" read "v.c.15". P.248 line 3 down, after "again in" insert "Guernsey in"; line 21 down, for "Cadgwick" read "Cadgwith"; line 11 up, for "1972" read "1872". P.249 line 2 down, for "CUMBRIA" read "WESTMORLAND v.c.69"; line 10 up, for "Hagget" read "Haggett".

Additions to Annexe II:

Pammene ignorata Kuznetzov. DEVON S. Axminster, 23.6 at light. **First British record** (ECP-C, *Ent. Gaz.* **39**: 40). Possibly immigrant.

Sitachroa palealis* D. & S. Kent W. East Malling, on Medway bank, 26.7, a strong colony (E.G. Philp, *Ent. Rec.* **99: 130). Apparently established in this area.

Gonepteryx cleopatra L. CHANNEL ISLANDS Jersey, 10.8, La Pulente, male closely watched among dunes by Mrs J. Banks. First Channel Island record (R. Long, *Ent. Gaz.* **38**: 202).

Nymphalis antiopa L. CHANNEL ISLANDS Jersey, 1.8, one found moribund north of St. Helier by Miss S. Garrett (R. Long, *ibid*).

Agrius convolvuli L. CO. CORK St. Gabriel's Radar Station, 2.10 (RFH in *INJ* **22**: 320).

Acherontia atropos L. BERKS, v.c.22. Faringdon, empty pupa case among potatoes, September (J.D. Turner, *Bull. amat. Ent. Soc.* **46**: 42).

**Leucoma salicis* L. CORNWALL W. Truro, 21.6 (A. Spalding). CHANNEL ISLANDS Guernsey, La Broderie, 19.6, male (PDMC).

Orthonama obstipata Fab. ISLES OF SCILLY St. Mary's, Pendennis Head, early September (S. Nash, *Bull. amat. Ent. Soc.* **46**: 357).

Mythimna albipuncta D. & S. CHANNEL ISLANDS Guernsey, St. Peter Port, mid June, female (M.D. Bryan, *Ent. Rec.* **99**: 126).

Mythimna vitellina Hübn. HANTS N., v.c.12, 19.6, 6.10 (R.A. Bell per BS). KENT E. Dungeness, 19.6, two, 2.7, 22.8, 1.9; Greatstone, 14.9 (S. Clancy per BS). BUCKS. Willen, 6.10 (GEH). LANCS. N., v.c.60 Preesall, 27.6 (R.E. Dawson per M. Evans).

Among the usually common immigrant species a record of *Macroglossa stellatarum* L. at Wolverhampton, Staffs is of some special interest, both because it was seen flying at 7 p.m. on July 2 and is also said to be the first record for this very inland county (G.T. Knight, *Bull. amat. Ent. Soc.* **46**: 158). Surprisingly, although in Britain this species was unusually numerous and widespread, its appearance in Ireland was disappointing with only 29 reported (RFH, *INJ* **22**: 320).

1987

Corrections: Vol.100 p.226 line 9 up, for "Frenham" read "Fernham". P.228 line 2 down, after "24.8" insert "three".

Additions to Annexe I: direct recorders. Alexander, K., Austin R. & M., Easterbrook, M.A., Hipperson, D. for Norfolk Moth Survey; Peet, Dr T.N.D.; Reid, J., Rogers, M.

Additions to Annexe II, scarcer immigrant species:

**Platytes alpinella* Hübn. DORSET Preston and Radipole Lake, 14.7 (Martin Cade).

**Evergestis extimalis* Scop. DEVON S. Branscombe, 10.8 (S. Nash). Possibly immigrant.

**Ostrinia nubilalis* Hübn. HANTS ISLE OF WIGHT Freshwater, 14.7 (S.A. Knill-Jones).

Diasemia ramburialis Dup. DORSET Studland, 27.10 (D.C.G. Brown). *Palpita unionalis* Hübn. DORSET Portland B.O., 5.6, 10.7, 11.8, 11.9, 13.9, 20.9, 25.9, 26.9, 28.9, (10 in all) (M. Rogers).

Papilio machaon L. CHANNEL ISLANDS Guernsey, St. Peter's, early 10, found dead in greenhouse (per R. Austin).

Nymphalis antiopa L. YORKS. v.c.62 Swinton, near Malton, late October, seen in garden by Miss M.A. Fox (A. Grayson, *Bull. amat. Ent. Soc.* **47**: 224).

Idaea vulpinaria* Lempke DORSET Portland, 3.7 (A.J. and R. Fairclough). *Rhodometra sacraria* L. DORSET near Abbotsbury, 30.8, one faded (D. Rey, *Bull. amat. Ent. Soc.* **47: 152); Portland B.O., 17.8, 22.8, four, 23.8, ten, 24.8, 26.8, 28.8, 17.9, 18.9, forty three, 19.9, 20.9, nine, 21.9, two (76 in all) (M. Rogers). Cessation of the records soon after

this was due to a defect in the light trap. HERTS. Waltham Cross, 22.9, 24.9, two, 25.9, two (B. Taggart and A. Hughes per C.W. Plant). KENT W. East Malling, 9.9. (M.A. Easterbrook). NORFOLK W. Hockwold, 27.8 (J.L. Fenn per D. Hipperson). SOMERSET S. Crewkerne, 1.9 (J. Reid).

Orthonama obstipata Hübn. DORSET Portland B.O., 20.9 (M. Rogers). MONTGOMERY Newtown, 3.8, female, infertile (M. Townsend). CO. CORK E. Fota Park, 17.8, male (K.G.M. Bond).

Agrius convolvuli L. DORSET Portland B.O., 23.8, 18.9, two, 7.10 (M. Rogers). NORFOLK E. East Harling, 25.9 (J. Breech per D. Hipperson). NORTHAMPTON Long Buckby, 17.9, male found by a dog (B. Laney, *Bull. amat. Ent. Soc.* **47**: 153) RADNOR Newbridge-on-Wye, 26.9; Abbeycwmhir, similar date, one (P.M. Slater). CO. WATERFORD Passage East, 18.8, CO. CORK MID Cork City, 13.9, female. CO. WEXFORD, September, October, four. ULSTER September, October, four brought to Museum (R.F. Haynes, *INJ* **22**: 500).

Acherontia atropos L. CO. CORK MID Grenagh, c.24.5 (per K.G.M. Bond). CO. WEXFORD, 26.10, two from separate localities (R.F. Haynes, *ibid*).

Hyles gallii Rott. NORFOLK W. Holkham, August (B. Scampion per D. Hipperson). WORCS. Perdiswell Nurseries, 12.10, two full grown larvae from which a moth emerged 18.4.1988; a crippled moth also found at the end of a polythene tunnel 18.5.1988 (D. Badmin per J.E. Green). An unusual example of winter survivals out of doors, though with some artificial protection.

Hyles livornica Esp. DORSET Portland B.O., 29.4 (M. Rogers).

**Leucoma salicis* L. CHANNEL ISLANDS Guernsey, Bordeaux, 16.7; Freia Plaidy, end July (per R. Austin).

Lymantria dispar L. CHANNEL ISLANDS Le Chêne, 7.8 (TNDP).

Agrotis crassa Hübn. DORSET Portland B.O., 19.8 (M. Rogers). Only second British record on mainland.

Eurois occulta L. NORFOLK E. near Belagh (A. Wallis per D. Hipperson).

Mythimna albipuncta D. & S. CO. CORK MID Fountainstown, 19.8 (AAM).

Mythimna vitellina Hübn. DEVON S. Chardstock, 23.8 (A. Jenkins, *Br. J. Ent. nat. Hist.* **1**: 34). DORSET Portland B.O., 5.6, 11.8, 11.9, 13.9, 15.9, 20.9, 25.9 (M. Rogers).

Mythimna unipuncta Haw. DORSET Portland B.O., 20.9, 28.9 (M. Rogers).

Of these species **Idaea vulpinaria* Lempke, *Lymantria dispar* L., *Agrotis crassa* L. were not mentioned in the previous report for 1987. They raise the total of wholly immigrant species to 31.

Cynthia cardui L. Immigration of December 20, 1987/January 7, 1988. Add DORSET Portland B.O., 23.12, one; Golden Cap, 31.12, several. HANTS S. Vicar's Hill, Boldre, 22.12; Hayling Island, 25.12, five, possibly seven. KENT W. East Malling, 22.12. SUSSEX E. Bewl Water Reservoir, 22.12. We have also several new records in early January, 1988, which will be dealt with in the report for that year.

Immigrant Lepidoptera recorded in Norfolk during October 1988

AS A result of a phone call on 20th October from M. Parsons of Ninfield, Sussex, who informed me that he had taken a number of *Heliothis armigera* Hübn. in his m.v. trap during recent nights, I decided to run an m.v. trap in a Norwich garden. To my surprise, on the morning of the 21st, single males of *Spodoptera exigua* Hübn. and *H. armigera* were in the trap.

This success prompted me to visit the Norfolk coast, at Winterton, on the evening of the 21st, when I was joined by K. Saul. Two m.v. light were set up by the sea front car park at approximately 18.00 hours when it was mild, calm and misty. Almost immediately, numbers of common immigrant species were noted at both traps; *Nomophilia noctuella* (D. & S.), *Agrotis ipsilon* Hufn., *Phlogophora meticulosa* L. and *Autographa gamma* L.. These were soon accompanied by two scarcer species; *Palpita unionalis* (Hübn.) (single males at 18.55 and 19.05 hours) and *H. armigera* (single males at 19.26 and 19.31 hours). In view of their early arrival at the lights, it would seem likely that these individuals reached Norfolk during the previous night. Soon after 20.00 the mist cleared and the temperature dropped rapidly, thereafter few moths were arriving at the lights and we packed up at about 21.00 hours.

I did not return on the 22nd as it was cool and clear. However, on the 23rd the favourable mild and misty conditions returned, and I made another excursion to Winterton. Again, two m.v. lights were set up on the sea front, and running from approximately 17.30. By 17.36 a female *P. unionalis* had been attracted, together with numbers of *N. noctuella, Udea ferrugalis, A. ipsilon, P. meticulosa* and *A. gamma*. In addition, two *Noctua pronuba* L. turned up, and I assumed that these may have been migrants also. At 18.21, the highlight of the evening was finding a male *Chrysodeixis acuta* Walker, resting on a marram flower head near to one of the traps. Unfortunately, soon after this the mist cleared and, as with the previous nights, the temperture dropped quickly, resulting in a few moths being active. However, a bonus whilst packing up, was finding a female *Orthonama obstipata* Fabr. inside one of the traps.

The following evening of the 24th was windy and clear, even so K. Saul and myself ran two m.v. lights, again at Winterton, but only small numbers of a few common species were attracted. Subsequent nights that week were also unproductive and no further migrants were reported from Norfolk. — A.P. FOSTER, 58 St Laurence Avenue, Brundall, Norwich, Norfolk NR13 5QN.

***Orthosia opima* Hübn., the Northern Drab (Lep.: Noctuidae) resident on the Essex Marshes 1960-1980.**

During my teenage collecting days I well remember finding a number of greenish noctuid larvae feeding amongst sea lavender (*Limonium vulgare*) on a tidal salt-marsh in Essex. Not being all that interested in what I thought to be an ordinary caterpillar I left them alone. However, in 1970 and 1971 I thought I would try and find out what they could be. In 1970 I failed to breed them through but in early July 1971, I decided to take just four of the largest larva. These fed on sea lavender for a few days, pupated and produced three fine specimens of the Northern Drab (*Orthosia opima* Hübner) the following April. These seemed to be a larger race than the typical heathland form.

From time to time the late Mr H.C. Huggins and myself had taken the odd specimens in our gardens at mercury-vapour light at Westcliff and Thundersley respectively. In those days it had always been considered a wood or heath insect, the larva feeding on sallows etc. Its appearance on a wet salt marsh was most extraordinary and he hoped I would follow it up to see how far it existed and list all its food plants. This I did, but failed to send in my observations further than my own local Natural History Society.

However, it now seems to be a resident species on most Essex saltings with moths and egg batches found most years. I have still to find the larva feeding on any other plant except sea lavender, although they may nibble grasses in the early stages.

I know this is past history and realise I should have sent this interesting discovery to the *Entomologist's Record*. Nevertheless, better late than never! — D. DOWN, 16 Woodend Close, Thundersley, Essex.

***Pachycnemia hippocastanaria* Hübn. (Lep.: Geometridae) in January**

I HAVE been running a Robinson trap occasionally in the small Luscombe Valley Nature Reserve owned and managed by Poole Borough Council. This reserve lies between Parkstone Golf Course and Poole Harbour, and is about 1 km from the coast at Sandbanks. It lies within v.c.9 (Dorset) and 10 km square SZ 09.

The evening of 26 January 1989 was overcast, humid, still and relatively mild for the time of year. It seemed a propitious night to try to record the presence in the reserve of the several Geometers and Orthosiinae, which I

knew to be already flying elsewhere. Accordingly the trap was run unattended in the reserve from 1750 to 2030 GMT. I was to be disappointed in my prime objective as none of the hoped-for species of macromoth had entered the trap or come to rest on the sheet. However, I was most surprised to find one fresh specimen of *P. hippocastanaria* inside the trap and another on the sheet. There were no other macromoths. As regards micromoths, there was only one specimen each of *Acleris hastiana* and another *Acleris* species.

The prolonged spell of unseasonably mild weather in December 88 and January 89 has been responsible for exceptionally early emergences of the several species that are prone to appear in warmer spells in winter. However, the appearance of adults of *P. hippocastanaria* in January was so unexpected that I sent the specimens to my friend Brian Baker for his expert opinion. He kindly confirmed the speciation and determined both individuals to be males.

The question arises as to whether these individuals arise from resident stock or are immigrants. There is no indication in the literature in my possession that this species is an occasional immigrant. Consequently, I presume that these individuals must be emergences from locally overwintering pupae, the emergences being some ten weeks early due to the mild weather. The nature reserve is confined to the valley floor where heather, the larval foodplant, exists very sparingly. However, there is plenty of heather in the immediate neighbourhood. I have not so far confirmed residency of the species by trapping or sweeping at the normally suitable times of the year.

My thanks are due to Brian Baker for his help, Mrs Axford for helping to carry and deploy the trapping equipment, and Poole Borough Council for permission to operate a trap in the reserve. — G.G. EASTWICK-FIELD, Little Earlstone, Burghclere, Newbury, Berks.

Unusual Pairing in Odonata at Hothfield Common Nature Reserve, Kent

HOTHFIELD Common Nature Reserve is the only Kent breeding site for *Orthetrum coerulescens* (Fab.) where a strong but small colony survives in Kent's remaining valley bog. The colony is observed throughout the breeding season such that the requirements of the species may be accounted when devising management plans for the site.

On 11.8.87 an incident occurred at midday which may be of interest. A male of the species *Sympetrum striolatum* (Charpentier), which also breeds at and near the site, was observed carrying a male *O. coerulescens* as it would a female of its own species for oviposition.The pair continued in tandem for at least three minutes from the first observation. The *O. coerulescens* remaining motionless while the *S. striolatum* repeatedly dipped the other's abdomen into the shallow waters of the mire. — N. ONSLOW, 1 Windmill Close, Willesborough, Ashford, Kent TN24 0AU.

A further note on *Cleorodes lichenaria* Hufn., the Brussels Lace (Lep.: Geometridae).

FURTHER to my recent notes on this species at Cap Sizun nature reserve in Brittany (*Ent. Rec.* **100**: 274-275), where larvae of this species feed on *Ramalina siliquosa* growing on rock, it now appears certain that *lichenaria* larvae have the same habit in Cornwall. The species occurs at Kynance Cove, where there are no trees (Paul Siddons, pers. comm.); furthermore pupal cases similar to those found in Brittany, and presumed to be of the same species, were found on the Lizard peninsula, on *Ramalina*, by Peter James of the British Museum (Natural History). — ADRIAN SPALDING, Tregarne, Cusgarne, Truro, Cornwall.

Provisional Atlas of the click beetles (Coleoptera: Elateroidea) of the British Isles by **Howard Mendel.** 89 pp. numerous maps. Limp. Institute of Terrestial Ecology, 1988. £5.50

This booklet presents the results of a national scheme to map the distribution of click beetles started in 1983, mapping the distribution of 72 species, omitting a further nine presumed extinct or with only a single known locality. Maps use three symbols to denote distribution, based on 19th Century, 1900-1949 and post 1950 records. Although plotted on a 10km square basis, distribution by vice-county, using the same date bands, is also given. The publication of this *Atlas* is certainly a tribute to the industry of Howard Mendel and the coleopterists who supplied the records, and is a significant contribution to our knowledge of the distribution of click beetles.

Common Ground Beetles by **Trevor G. Forsyth.** 74 pp. Four colour plates; numerous figs. *Naturalists' Handbook* no.8. The Richmond Publishing Co Ltd. 1987. Paper £5.95, Boards £12.00.

Richmond Publishing took over this series of publications in 1987 from Cambridge University Press, and have maintained the high standard of the *Naturalists' Handbooks* series. Following a brief introduction there is a substantial chapter on the natural history of ground beetles (16pp); the main body of the work — a series of keys, illustrated with clear line drawings and supplemented with a selection of species illustrated in colour; a chapter on techniques and approaches to original work — including notes on collecting, killing, setting, breeding, dissecting etc; the work concludes with a checklist (in alphabetical order by genus), a bibliography and an index.

The student of the Carabidae is certainly spoilt for choice when it comes to selecting a modern work of reference on ground beetles — 1976 saw the publication of volume two of *Die Käfer Mitteleuropas*, by Freude, Harde and Lohse, 1985 the publication of part one of *The Carabidae (Coleoptera) of Fennoscandia and Denmark* by Carl H. Lindroth, with part two following in 1986 (both published as volume 15 of *Fauna Entomologica*

Scandinavica — with English text, and covering most of the British species). All of these works are a little heavy going for the non-specialist, so the publication of the volume under review is particularly welcome.

There is no easy way to provide an identification guide to the 340-odd species that occur in the British Isles, and the use of diagnostic keys is essential. In this work the keys are easy to use, and the line drawings clearly illustrate appropriate diagnostic features. Not all the British species are keyed out but the keys sensibly indicate which are critical species, advising caution on their identification. All of the common species should key out reasonably well, and thus the diligent student, be they ecologist or amateur naturalist, will be well served by this publication. NMD.

Checklist of fish and invertebrates listed in the CITES Appendices compiled by **Patricia Alamada-Villela**. 82pp. Paper cover. A4. Nature Conservancy Council. 1988. £11.00.

The purpose of this work is to provide a list of the species and subspecies of fish and invertebrates included in Appendices I, II and III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), concentrating on the *Red Data Book* species.

For each taxon there is a list of the countries in which the species occurs, or has been introduced, and an entry under four headings: the CITES appendix reference; the category status — using *Red Data Book* descriptors — for example, endangered, vulnerable, rare, indeterminate etc.; the major exploitation of the taxon — for insects this is generally for live animal trade or preserved specimens, but other groups can be exploited for food, such as fish, mussels and clams; trophies, such as giant clams; for medical products, such as the Medicinal Leech, or to satisfy the huge trade in shells and corals. The final heading gives one or more references which are cited in the extensive bibliography — 107 references for the fish, and 407 for the invertebrates. An index to the common and scientific names completes the work.

This compilation is much needed, giving an easy to use and informative synopsis of endangered species, and will be of particular use to all those concerned with the regulation of import and export of these species.

Paul Sokoloff.

Butterflies — The Lycaenidae by **Michael Easterbrook.** 24 pp; 26 colour illustrations. 210 x 150 mm. Shire Publications Ltd. 1988. £1.25.

This is the third booklet on the British Lepidoptera in the Shire Natural History Series, the previous two being on Hawk Moths and the Nymphalidae. All are by the same author, Michael Easterbrook. This latest volume on the Lycaenidae is similar in format, and comprises an introduction, short accounts of each of the British species, and finally sections on study methods and conservation.

The text is concise and well written, and includes most of the interesting features known about the Lycaenidae. It is extraordinary, in fact, how much detail has been included in such a small booklet. The specific section on the Common Blue, for example, covering less than ¾ page, describes the external morphology, the variable voltinism in Britain, has a brief resumé of the life history (including discussion of the adaptation by the larvae to resist toxins found in some plants of bird's foot trefoil), and also fits in distribution and ecological preferences of the butterfly.

The photographs are in general very good. The contrasting forms of female Common Blue, for example, are excellent. Colour reproduction in some cases is a little awry, for example the male Adonis Blue on page 12. Some of the species covered in the text, such as the Black Hairstreak and Northern Brown Argus, are not illustrated. Overall, an excellent follow-up of Michael Easterbrook's other booklets in the series and at an amazingly low cost of £1.25. Christopher Luckens

The Country Diary Book of Creating a Butterfly Garden by **E.J.M. Warren.** 144pp., many colour illustrations. Boards. Webb & Bower/Michael Joseph, 1988. £12.95.

This lavishly illustrated book sets out to be a user-friendly guide to the creation and maintenance of a domestic butterfly habitat. The chapters include How to make a butterfly garden, Growing plants from seed, How to make the most of your butterfly garden, Choosing the right flowers, The British butterflies and skippers, How to design your butterfly garden and a short appendix on the butterflies of North America, a check list of "golden rules" for butterfly gardening, a brief bibliography and list of useful addresses.

Having read many popular books and articles on "butterfly gardening", the reviewer has been repeatedly depressed by the poor quality of such publications — sweeping generalisations, inappropriate advice and cloying literary style seem to be necessary ingredients for authors of such works. It is therefore particularly pleasing to report that *Creating a Butterfly Garden* contains none of these features, being a first-class example of its *genre*!

The key to success appears to be a combination of narrative — helpful and informative — and artistic design. Printed entirely on cream paper there is a sympathetic mix of colour photographs of flowers and butterflies, many by the author, and reproductions of paintings by Edith Holden, author of *The Country Diary of an Edwardian Lady*. Holden's work, whilst not always entirely accurate, remains a delight to look at and is just right for this particular book. In retrospect, none of this is particularly surprising as the author, Miss Warren, is the daughter of the late B.C.S. Warren, the distinguished lepidopterist and authority on the genus *Erebia*.

Paul Sokoloff.

TO OUR CONTRIBUTORS

ALL MATERIAL FOR THE TEXT of the magazine as well as books for review must be sent to the EDITOR at 4 Steep Close, Orpington, Kent BR6 6DS.

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

(Founded by J.W. TUTT on 15th April 1890)

Contents

Notes and observations

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MICROLEPIDOPTERA — A REVIEW OF THE YEAR 1987

compiled by DAVID AGASSIZ

The Rectory, 10 High View Avenue, Grays, Essex RM17 6RU.

1987 was another poor year. In April there was a remarkable spell of fine weather, but this did not prove to be a good omen for the rest of the summer. The autumn was like 1986 rather better, but not enough to make up for the lost summer. Then came the great storm of 16th October, but the effects of this in the south east of England will take a few years to assess.

Such is the healthy state of the study of microlepidoptera that there are none-the-less further interesting records. Pride of place must go to *Eulamprotes phaeella* Heckford and Langmaid, for it is not often that a species new to science is added from these islands.

The other species new to Britain added to our list in 1987 are *Pammene ignorata* (Kuznetsov) which E.C. Pelham-Clinton was sharp enough to recognise among the moths taken in his Devon garden. Then *Sciota adelphella* (F.v.R.) was noticed by M.F.V. Corley among the insects taken by David Brotheridge near Swindon, and a week later Bob Dewick produced a specimen of the same species which had been concealed in his collection since 1959! This species could certainly be resident, but hitherto overlooked, although the insect if caught is not inconspicuous.

Several "lost" species have been rediscovered: *Brachmia ustalella* found by A.N.B. Simpson in Worcestershire is in a similarly exciting category to *A. palpella* in 1986, which itself has been found to be more widespread. A further specimen of *Ischonsia borreonella* after an interval of 60 years is also heartening and an encouragement not to write off seemingly extinct species. Further specimens of *Agonopterix capreolella* from the Isle of Wight is another example.

Tebenna micalis (Mann) is a new name for our list, but one which arises out of previous misidentification — probably of all the specimens found in Britain of *T. bjerkandrella* Thunb.

Clepsis rurestrana (Dup.) added to our list last year continues to be found, also by Bob Heckford. Among casually imported species a further specimen of *Lobesia botrana* found by D. Manning in Bedfordshire is of interest, especially since it was found in open country. *Endotricha consobrinalis* is another new importation.

There continues to be a stream of publications of value to the microlepidopterists, and local lists feature prominently. A list of species taken in a Rothamsted trap in Bangor appeared in the *Entomologist's Gazette* **39**: 141ff; further records from the Isles of Scilly are contained in the *Entomologist's Record* **99**: 269f, and from the Orkneys in *Ent. Gaz.* **39**: 181-3 and 185. The well-documented lists of migrants contain references to microlepidoptera for 1986 in *Ent. Rec.* **99**: 245 and for 1987 in **100**: 226f.

Most of the records are for 1987, but as in previous reviews some records from earlier years are included.

Acknowledgements

As always my thanks are due to those who have submitted records who are identified in the list by their initials. The nomenclature follows the systematic order of *An indexed list of British Butterflies and moths* by Bradley & Fletcher (1986) with any amendments and corrections incorporated in *A Field Guide to the Smaller British Lepidoptera*, Second edition, edited by A.M. Emmet, 1988.

In response to a request from some contributors the numbers from the 'Log book' have been left in this year. A slightly longer and earlier list of most records submitted is available from the compiler.

Contributors: B.R. Baker, R.J. Barnett, H.E. Beaumont, K.P. Bland, K.G.M. Bond, E.S. Bradford, M.F.V. Corley, A.M. Emmet, E.F. Hancock, R.J. Heckford, J.R. Langmaid, S.M. Palmer, M. Parsons, H.N. Michaelis, E.C. Pelham-Clinton, C.W. Plant, A.N.B. Simpson, F.H.N. Smith, D.H. Sterling, M.J. Sterling, P.H. Sterling, M.R. Young.

Systematic list

ERIOCRANIIDAE

6 *Eriocrania subpurpurella* (Haw.) — Holywlell (53) mines 1.vi.87 — JRL + ECP-C

12 *E. sangii* (Wood) — Caergwrle (51) — B. Formstone per HNM

NEPTICULIDAE

57 *Stigmella filipendulae* (Wocke) — Kynance Cove (1) reared from *Filipendula vulgaris* 5.ix.87 — RJH

85 *S. suberivora* (Staint.) — Worcs (37) — ANBS

87 *S. svenssoni* (Joh.) — Fingle Bridge (3) reared from 1. on *Quercus* 27.iv.87; Bayston Hill (40) one vacated mine 21.xi.87 — JRL

OPOSTEGIDAE

119 *Opostega salaciella* (Treits.) — Dinton (8) 13.vii.87 — SMP

121 *O. crepusculella* Zell. — Saffron Walden (19) 29.vi.87 — AME

INCURVARIIDAE

129 *Incurvaria pectinea* Haw. — Larval case on wood ants' nests — KPB, *Ent. Rec.* **99**: 278

132 *Lampronia praelatella* (D. & S.) — Loggerheads (51) — B. Formstone and M. Newstead per HNM

134 *L. flavimitrella* (Hb.) — Hamstreet (15) a few 4-6.vi.87, females associated with *Rubus fruticosus* — JRL and ECP-C

135 *L. luzella* (Hb.) — Moor Copse NR (22), 21.vi.86 — BRB

138 *L. fuscatella* (Tengst.) — Whixall Moss (40) three galls 11.iv.87, 1 bred — JRL

146 *Nemophora cupriacella* (Hb.) — West Burton (56) 12.vii.87, 12 females on *Dipsacus* heads, possibly suggesting this as a foodplant — HEB
149 *Adela cuprella* (D. & S.) — Dinton (8) 16-26.iv.87 — SMP
151 *A. croesella* (Scop.) — Worcs (37) 6.vi.87 — ANBS
152 *A rufimitrella* (Scop.) — Whitstable (15), adults on flowers of *Sisymbrium officinale* 14.vi.87 — ESB

HELIOZELIDAE
156 *Heliozela resplendella* (Stt.) — Glenstrathfarrar NNR (96) — MRY
157 *H. hammoniella* (Sorh.) — Worcs (37) 6.vi.87 — ANBS

PSYCHIDAE
180 *Diplodoma herminata* (Geoff.) — Holywell (53) one case 1.vi.87 — JRL and ECP-C
177 *Dahlica inconspicuella* (Stt.) — Coventry (38), 21.x.87 — M. Ball per RJB
186 *Psyche casta* (Pallas) — Cases on garage doors — B. Verdcourt, *Ent. Rec.* **99**: 257
195 *Sterrhopterix fusca* (Haw.) — Whixhall Moss (40) many larvae 30.v.87 — JRL & ECP-C

TINEIDAE
199 *Psychoides verhuella* Bruand — Rediscovered in Perths. (88), 1.viii.87 — KPB, *Ent. Gaz.* **39**: 12
205 *Ischonsia borreonella* (Mill.) — Portland (9), 15.viii.87 — ECP-C, *Ent. Rec.* **100**: 46, first record since 1926
211 *Haplotinea ditella* (P. & M.) — Bagley Wood (22) 4.vii.87, genitalia det. — PHS
277 *Oinophila v-flava* (Haw.) — Larva on *Pittosporum crassifolium* — RJH, *Ent. Rec.* **99**: 268

OCHSENHEIMERIIDAE
253 *Ochsenheimeria vaccullella* F.v.R. — Southwick (11) 19.vii.87 — JRL; Windsor Great Park (22) 7.viii.82 — AAA per BRB

LYONETIIDAE
256 *Leucoptera spartifoliella* (Hb.) — Ventnor (10) two 2.viii.87 — JRL and ECP-C
258 *L. lathyrifoliella* (Stt.) — Branscombe (3) mines on *Lathyrus pratensis* — JRL and ECP-C; *Ent. Rec.* **100**: 185
264 *Bedellia somnulentella* (Zell.) — Kennack Sands (1) reared from 1. on *Calystegia soldanella* — RJH

BUCCULATRICIDAE

272 *Bucculatrix cidarella* Zell. — Moreton (9) larvae on *Myrica* 13.viii.87, none on adjacent *Alnus* — JRL and ECP-C

276 *B. demaryella* (Dup.) — Havenstreet (10) one larva 7.viii.87 — JRL and ECP-C

GRACILLARIIDAE

285 *Caloptilia azaleella* (Brants) — Harold Hill (18) larva 8.v., imago 25.v.87 — AME

316 *Phyllonorycter roboris* (Zell.) — Caergwle (51) — M. Newstead per HNM; New to north Wales

325 *P. mespilella* (Hb.) — Great Ridge Wood (8) 28.iv.87 —SMP

330 *P. cerasicolella* (H.-S.) — Dolgarrog (49) — HNM; Llay (50) — B. Formstone per HNM

336 *P. dubitella* (H.-S.) — Pucketty, near Faringdon (22) 6.v.86 — MFVC

338 *P. cavella* (Zell.) — Caergwrle (51) — M. Newstead per HNM

343 *P. quinnata* (Geoff.) — Cefn y Bedd (50) — B. Formstone per HNM

347 *P. anderidae* (Fletch.) — Sutton Park (38) '84 — ANBS.

349 *P. nigrescentella* (Logan) — Branscombe (3) mines on *Lathyrus pratensis* 9.viii.87 — JRL and ECP-C, *Ent. Rec.* **100**: 185

366 *P. sagitella* (Bjerk.) — East (50) mine — B. Formstone per HNM, an encouraging sign after gloomy news of recent years.

CHOREUTIDAE

386 *Tebenna micalis* (Mann) — The Warren near Noss Mayo (3) cocoon on *Pulicaria dysenterica* with extruded unemerged pupa. Other specimens from the vicinity previously misidentified as *T. bjerkandrella* — RJH

388 *Prochoreutis myllerana* (Fabr.) — Sawbridgeworth Marsh NR (19 and 20) adults 25.vi.87 — AME

DOUGLASIIDAE

399 *Tinagma balteolella* F.v.R. — Second Kentish locality (14)— PAS, *Ent. Rec.* **100**: 152

YPONOMEUTIDAE

403 *Argyresthia glabratella* (Zell.) — Grovely Wood (8) 10.vi.87 — SMP

407 *A. dilectella* Zell. — Douglas (H4) 20.vii.87 — KGMB, second Irish record

412 *A. pygmaeella* (D. & S.) — Isle of Man, several localities (7) 85, 86, 87. — KGMB

415 *A. retinella* Zell. — Curraghs Wildlife Park, IoM (7), 25.vii.87 — KGMB

416 *A. glaucinella* Zell. — Fota (H5) 13.vii.86 — KGMB

435 *Zelleria hepariella* Staint. — Saffron Waldon (19) 20.viii. and 3.ix.87 — AME
441 *Paraswammerdamia lutarea* (Haw.) — West Burton Power Station (56) 12.vii.87 — HEB per MJS
447 *Roeslerstammia erxlebella* (Fabr.) — Ventor (10) many 2.viii.87 — JRL and ECP-C
456 *Ypsolopha horridella* (Treits.) — Coed Gorswen (49) — HNM
468 *Rhigognostis incarnatella* (Steudel) — Stepaside (H21) three, 11.vii.87 — KGMB
473 *Acrolepiopsis assectella* (Zell.) — Portland (9) 15.viii.87 — JRL and ECP-C
474 *A. betulella* (Curt.) — Beinn Cruachan (98) bred from larva 23.vii.87 — KPB, *Ent. Rec.* **100**: 57f

EPERMENIIDAE

479 *Cataplectica farreni* Wals. — Swincombe Downs (23) 26 and 28.vii.87 flying around *Pastinaca* — PHS
481 *Epermenia illigerella* (Hb.) — Second generation larvae feeding in stem rather than umbels of *Angelica sylvestris* — RJH, *Ent. Rec.* **100**: 98

COLEOPHORIDAE

494a *Coleophora prunifoliae* Doets — Pucketty, near Faringdon (22), 22.vii.86 — MFVC
498 *C. alnifoliae* Barasch — Rannoch (88) 23.vi.51 — KPB, *Ent. Rec.* **100**: 47f. **New to Scotland**
501 *C. siccifolia* Stt. — Brasenose Wood (23), several cases on *Crataegus* ix.87 — PHS
502 *C. trigeminella* Fuchs — Winchester (11) 5.vi.87 at m.v. light, gen. det. — DHS
511 *C. orbitella* Zell. Bernwood Forest (24) two larvae ix.87 — PHS; Botley Wood (11) larva on *Betula*, 10.ix.87 — DHS and JRL
513 *C. potentillae* Elisha — West Burton Power Station (56) case on *Potentilla palustris* 23.v.87 — MJS
517 *C. frischella* (Linn.) — Loggerheads (51) 30.v.87 — B. Formstone per HNM
525 *C. solitariella* Zell. — Whitstable (15), bred 11-24.vii.87 — ESB
531 *C. ochrea* (Haw.) — Durdham Down (34) larvae — DJLA, RJH, JRL, AME & ECP-C
533 *C. anatipennella* (Hb.) — West Burton Power Station (56) case 23.v.87 — MJS
546 *C. genistae* Stt. — Penmachno (49) cases — HNM
561 *C. therinella* Tengst. — Buckland Warren (22), 15.vii.86 — MFVC
568 *C. versurella* Zell. — Pucketty, near Faringdon (22) 15.vii.87 — MFVC

ELACHISTIDAE

593 *Elachista regificella* (Sirc.) — Rowsley (57) one mine in *Luzula sylvatica* 4.iv.87 — JRL & ECP-C; Scottish records — KPB & RPK-J, *Ent. Gaz.* **39**: 277

594 *E. gleichenella* (Fabr.) — Larvae mining *Luzula sylvatica* and Scottish records — KPB & RPK-J, *Ent. Gaz.* **39**: 277-8

598 *E. kilmunella* Stt. — Brenig (50) — HNM

603 *E. subnigrella* Doug. — West Burton Power Station (56) 23.v.87 — MJS

609 *E. cerusella* (Hb.) — Connah's Quay (51) M. Newstead per HNM

612 *E. collitella* (Dup.) — Portland (9) one 11.viii.87 — JRL & ECP-C

624 *Biselachista trapeziella* (Stt.) — Description of mine in *Luzula sylvatica* and Scottish localities, KPB & RPK-J, *Ent. Gaz.* **39**: 278-280

629 *B. utonella* (Frey) — Emer Bog (11) a few mines on *Carex paniculata* 4.v.87, 1 bred — DHS & JRL

OECOPHORIDAE

634 *Schiffermuelleria grandis* (Desv.) — Near Canonteign Barton (3) 1.vii.87 — RJH, second Devon specimen — RJH, *Ent. Gaz.* **39**: 191

639 *Bisigna procerella* (D. & S.) — Whitstable (15) 20.viii.87 — ESB

640 *Batia lunaris* (Haw.) — Fletton (29) 13.vii.87 — MP

653 *Aplota palpella* (Haw.) — Savernake Forest (8) bred from larvae found in moss on old oak trees 4.v.87 — PHS, JRL, ECP-C, life history described *Ent. Rec.* **99**: 275f; Blenheim Park (23) bred from larvae 27.vi.87 — PHS, JRL & DHS; Ashclyst Forest (3) 1. on trunks of beech, 1.vii.87 emerged 25 & 29.vii.87 — RJH, *Ent. Rec.* **100**: 207

677 *Epigraphia steinkellneriana* (D. & S.) — Bedford Purlieus (32) 24.iv.87 — MP

668 *Enicostoma lobella* (D. & S.) — Great Yews (8) 11.vi.87 — SMP

696 *Agonopterix propinquella* (Treits.) — Dinton (8) 4.x.87 — SMP

708 *A. carduella* (Hb.) — Newborough (52) — HNM

715 *A. capreolella* (Zell.) — Ventnor (10) larvae 2.viii.87 — JRL & ECP-C

718 *Ethmia dodecea* (Haw.) — Bedford Purlieus (32) 6.vii.87 — MP

719 *E. funerella* (Fabr.) — Holme Fen NNR (29) 23.vi.87 — APF

GELECHIIDAE

724 *Metzneria lappella* (Wals.) — West Burton Power Station (56) 7.vii.87 — MJS

727a *M. aprilella* (H.-S.) — Early Berks (22) records: Sulham 1901 and Streatly 1915 — MFVC, *Ent. Gaz.* **39**: 198

728 *Paltodora cytisella* (Curt.) — Fovant Wood (8) 13.vii.87 — SMP; Drax, near Selby (64) 24.vii.87 — HEB

731a *Eulamprotes phaeella* Heckford and Langmaid — Description of species **new to science** — RJH and JRL, *Ent. Gaz.* **39**: 1-8; South Wales — ANBS, *Ent. Gaz.* **39**: 234

734 *Argolamprotes micella* (D. & S.) — Winchester (11) 13.vii.87 in m.v. trap — DHS, most easterly record

749 *Sitotroga cerealella* (Ol.) — Worcester Museum (37) larvae on corn dollies — ANBS, *Ent. Rec.* **100**: 162

750a *Psamathocrita argentella* P. & M. — Hayling Island (11) flying around *Agropyron pungens* after heavy rain, at 1630 hrs. 13.vi.87 — DHS and JRL

761a *Athrips rancidella* (H.-S.) — Notes on the biology — PAS and JMC-H, *Ent. Rec.* **99**: 253

769 *Teleiodes wagae* (Nowicki) — Peasmarsh (14) two 6.vi.87 — JRL and ECP-C; Barham (15), larva on *Betula* moth reared 14.v.87 — AME, *Ent. Gaz.* **39**: 76

806 *Gelechia nigra* (Haw.) — Calborne (10) from larva on *Populus alba* 4.vii.87 — EFH

813 *Scrobipalpa salinella* (Zell.) — Newton (10) 4.viii.87 — JRL and ECP-C

816 *S. atriplicella* (F.v.R.) — Towan Beach, Roseland (2) 22.viii.87 — FHNS

823a *Scrobipalpula tussilaginis* (Frey) — Dorset, two coastal localities (9) larvae on *Tussilago* 30.x.87 — RJH; Milford-on-Sea (11) larvae 7.xi.87 — JRL

826 *Caryocolum vicinella* (Doug.) — Llandudno (49) — HNM

828 *C. viscariella* (Stt.) — Cullykhan (94) bred — MRY, first record for north east Scotland

839 *Nothris congressariella* (Bruand) — North Cornish coast (1) 9.ix.87 — PNS per FHNS; new to mainland Britain

844 *Syncopacma larseniella* (Gozm.) — Aldermaston (22), 9.vii.87 — PS per BRB.

864 *Dichomeris ustalella* (Fabr.) — Worcs. (37) 6.vi.87 — ANBS & MWH; larvae on *Tilia cordata* ix.87 — ANBS, First record since 1861, *Ent. Rec.* **101**: 17f

867 *Brachmia inornatella* (Doug.) — Whitstable (15) 28.vi.86 — ESB

MOMPHIDAE

874 *Blastobasis decolorella* (Wals.) — Chapelton (77) 6.vii.87 — EFH

882 *Mompha locupletella* (D. & S.) — Near Gwbert (46) reared from *Epilobium parvifolium* viii.87 — ANBS

885 *M. conturbatella* (Hb.) — Cors y Sarmau; Maentwrog (48) — HNM

COSMOPTERIGIDAE

896 *Cosmopterix orichalcea* Stt. — Leckford (121) mines in *Phalaris arundinacea*, 13-21.ix.87 — DHS & JRL, not all larvae left mines to

form hibernating cocoon, some spun cocoons inside the mine, another remained inside but spun against a leaf — JRL & DHS

898 *Limnaecia phragmitella* Stt. — Morton Lochs NNR (85), vii.87 — M.R. Shaw, *Ent. Rec.* **100**: 45

905 *Blastodacna hellerella* (Dup.) — Ulverston (69) 1.vii.87 — EFH

907 *Dystebenna stephensi* (Stt.) — Wanstead Flats (18) 1.viii.87 — PHS

TORTRICIDAE

944 *Aethes williana* (Brahm)—Holywell (53) one 1.vi.87 — JRL & ECP-C

948 *A. margaritana* (Haw.) — Chislet Colliery (15) bred from seed-heads of *Achillea millefolium*, 6-14.vii.87 — ESB

951 *A. beatricella* (Wals.) — West Burton Power Station (56) common — MJS

955 *Eupoecilia ambiguella* (Hb.) — Newtown Common (12) larvae in berries of *Frangula* 16.viii.87 — PHS

961 *Falseuncaria degreyana* (McLach.) — Foxhole Heath (26) 12.viii.87 — PHS

971 *Pandemis cinnamomeana* (Treits.) — Herodsfoot (2) 1, on *Salix* 4.v.87 em. 4.vi.87 — FHNS

977 *Archips podana* (Scop.) — Monifieth, Angus (90) — MRY

982 *Choristoneura diversana* (Hb.) — Ovesley Wood (38), 22.vi.61 — S.E.W. Carter per RJB

985 *Cacoecimorpha pronubana* (Hb.) — Central Speyside (96) bred from willow shoots at a commercial nursery — MRY; Cork (H4) 16.ix.87 — KGMB, **new to Ireland**, *Ir. Nat. J.* **22**: 454

990 *Aphelia unitana* (Hb.) — Bucks Mills (4) reared from 1. on *Rumex acetosa* & *Heracleum*. 28 + & 30.v.87 — RJH; *Ent. Rec.* **100**: 184f

988 *Epiphyas postvittana* (Walk.) — Adults in March — *Ent. Rec.* **99**: 283

1001 *Lozotaeniodes formosanus* (Gey.) — Rossett (50) two specimens at light, new to north Wales — M. Grice per HNM

1008 *Philedone gernignana* (D. & S.) — Roydon Common (28) 6.vii.87 bred from *Myrica gale*, second record from this area — MP

1011 *Pseudargyrotoza conwagana* (Fabr.) — Second and possibly third generations — AME, *Ent. Rec.* **100**: 97

1021 *Cnephasia assecana* (D. & S.) — Ashey Down (10) from larva on *Viburnum lantana*, 26.vi.87 — EFH

1023 *C. genitalana* P. & M. — Pucketty, near Faringdon (22), 12.viii.87 — MFVC

1027 *Neosphaleroptera nubilana* (Hb.) — West Burton Power Station (56) 12.vii.87 — HEB per MJS

1029 *Eana osseana* (Scop.) — Colliford reservoir (2) several 23.vii.87 — FHNS

1059 *Acleris abietana* (Hb.) — Kielder Forest (67) xi.85 and ii.86, Hamsterly Forest (66) iv - vi.87 and Chopwell Wood (66) 20.xi.87 — APF, *Ent. Rec.* **100**: 186f. First records for England

1061 *A. literana* (Linn.) — Gresford (50) — M. Newstead per HNM

1066 *Celypha woodiana* (Barr.) — Stratford-on-Avon (38) '84 — J.M. Price per RJB, *Proc. Birm. Nat. Hist. Soc.* **25**: 207

1067a *C. rurestrana* (Dup.) — Described as **new to Britain**, Ilfracombe (4) two 10.vii.87 and Tintern (35) — RJH *Ent. Gaz.* **39**: 193-196

1068 *Olethreutes rivulana* (Scop.) — Mhoinne Mhor NNR (98) on a salt marsh — MRY

1075 *O. olivana* (Treits.) — Mhoinne Mhor NNR (98) on a salt marsh — MRY

1106 *Lobesia reliquana* (Hb.) — Maentwrog (48) — HNM

1107 *L. botrana* (D. & S.) — West Wood, Knotting (30) 21.viii.87 — D. Manning, second occurrence in Britain

1108 *L. abscissana* (Doubl.) — Leeds (64) 12.viii.87 — HEB

1115 *Ancylis achatana* (D. & S.) — Cefn-y-Bedd (50) — B. Formstone & M. Newstead per HNM

1116 *A. comptana* (Fröl.) — Graig Fawr (51) — HNM

1118 *A. uncella* (D. & S.) — Hatfield Moors (63) 17.v.87 — HEB

1197 *Eucosma campoliliana* (D. & S.) — Ellenglaze near Holywell Bay (1) two at m.v. — PNS per FHNS

1198 *E. pauperana* (Dup.) — Fairmile, Berks Downs (22) 2.vi.86 — JMC-H

1199 *E. pupillana* (Clerck) — Oxford railway bank (22) '87 — PHS

1222 *Strophedra nitidana* (Fabr.) — Coed Cymerau (48) — HNM

1223 *Pammene splendidulana* (Guen.) — Black Lochs oakwoods near Oban (98) — MRY

1227 *P. inquilina* Fletch. — near Canonteign (3) 21.iv.87 — RHJ

1228a *P. ignorata* (Kuzn.) — Axminster(3) — ECP-C **New to Britain**, *Ent. Gaz.* **39**: 40

1230 *P. suspectana* (L. & Z.) — Lashford Lane Bog, Dry Sandford (22) 24.vi.86 — MFVC

1231 *P. spiniana* (Dup.) — Worcs. (37) ix.87 — ANBS

1243 *Cydia pallifrontana* (L. & Z.) — Waterly Railway Cutting (32) 24.vi.87, Bedford Purlieus (32) 6.vii.87 APF & MP

1245 *C. janthinana* (Dup.) — Penhale (1) 4.vii.87 — FHNS

1248 *C. molesta* (Busck) — Winchester (11) bred from a Sainsbury's peach imported from Italy, emerged 30.ix.87 — DHS

1266a *C. illutana* (H.-S.) — Southsea (11) 10.vi.75 — JRL, *Ent. Rec.* **100**: 162. Earliest record of species from Britain

1277 *Dichrorampha senectana* Guen. — Caergwrle (51) B. Formstone per HNM; Dolgarrog (49) — HNM

1278 *D. sequana* (Hb.) — Cefn-y-Bedd (50) — B. Formstone per HNM West Burton Power Station (56) common 4.vii.87 — MJS; Ventnor (10) a few 2.viii.87 — JRL & ECP-C

PYRALIDAE

1303 *Agriphila selasella* (Hb.) — Mhoinne Mhor NNR (98) on a salt marsh — RPK-J per MRY

1307 *A. latistria* (Haw.) — Whitstable (15), 31.viii.87 — ESB

1316 *Catoptria falsella* (D. & S.) — Whitstable (15), 18.viii.87 — ESB

1329 *Schoenobius forficella* (Thunb.) — Gresford (50) — M. Newstead per HNM

1348 *Parapoynx stratiotata* (Linn.) — Loch Brnluasgan near Achnamara (101) — MRY & RPK-J

1357 *Evergestis extimalis* (Scop.) — Foxhole Heath (26) 29.vi.87 — MP

1358 *E. pallidata* (Hufn.) — Saffron Walden (19) 17.vii.87 — AME

1367 *Pyrausta cingulata* (Linn.) — Graig Fawr (51) — HNM

1380 *Eurrhypara perlucidalis* (Hb.) — Coventry (38) viii.86 — J. Robbins; '87 — M. Ball per RJB; West Burton Power Station (56) 7.vii.87 — MJS; Old Rossington (63) 4 & 13.vii.87 — R.I. Heppenstall per HEB; Dinton (8) 4.vii.87 — SMP, *Ent. Rec.* **100**: 134

1382 *Anania verbascalis* (D. & S.) — Sandhurst (22) — RWP per BRB

1387 *Nascia cilialis* (Hb.) — Ramparts Field (26) 29.vi.87, Fouldon Common (28) 18.vi.87, East Harting Common (28) 2

1399 *Dolicharthria punctalis* (D. & S.) — Felpham (13) common 13.vii.87 — MP; Pembrokeshire (3), 28.vii.87 — G.L. & M.A. Finch, *Ent. Rec.* **100**: 28

1403 *Diasemiopsis ramburialis* (Dup.) — Dinton (8) 20.x.87 — SMP, *Ent. Rec.* **100**: 94

1408 *Palpita unionalis* (Hb.) — Southsea (11) one 20.x.87 — JRL

1421 *Aglossa pinguinalis* (Linn.) — Llandudno (49) '74 & '78 — B. Skinner per HNM

1424a *Endotricha consobrinalis* Zell. — A specimen of this species was bred in Colchester from celery imported from Israel — B. Goodey per AME

1430 *Paralispa gularis* (Zell.) — Plympton (3) bred from pet food — RJH, *Ent. Rec.* **100**: 132

1433 *Cryptoblabes bistriga* (Haw.) — Herodsfoot (2) two at m.v. 28.vi.87 — FHNS

1450 *Metriostola betulae* (Goeze) — Whixall Moss (40) many larvae 30.v.87 — JRL & ECP-C

1445 *Pempelia formosa* (Haw.) — West Burton Power Station (56) 7.vii.87 — MJS; Leigh, (37) 3.vii.86 — ANBS, *Ent. Rec.* **100**: 189

1447a *Sciota adelphella* (F.v R.) — Swindon (7) '87 — D. Brotheridge per MFVC; Bradwell (19) — R. Dewick. **New to Britain**

1456 *Epischnia bankesiella* Rich. — Perrancoombe (1) 16.viii.87 at m.v. — FHNS

1454 *Dioryctria abietella* (D. & S.) — Pailton (38) 26.vii.87 — K.C. Greenwood per RJB

1454a *Dioryctia schuetzeella* Fuchs — Windsor Forest (22) — P.J. Baker per BRB
1455 *D. mutatella* Fuchs — Kineton (38) 7.viii.87 — D. Brown per RJB
1435 *Acrobasis tumidana* (D. & S.) — Dinton (8) 18.viii.87 — SMP
1461 *Assara terebrella* (Zinck.) — Birch Park, near Colchester (19) three, 11.vii.87 — B. Goodey
1464 *Gymnancyla canella* (D. & S.) — Spurn (61) late vii.87 — B.R. Spence per HEB
1470 *Euzophera pinguis* (Haw.) — Gresford (50) — B. Fromstone per HNM
1471 *Homoeosoma sinuella* (Fabr.) — Leeds (64) 28.vi.87 — HEB
1474 *Ephestia parasitella* Stdgr — Dinton (8) 4.vii.87 — SMP

PTEROPHORIDAE

1501 *Platyptilia gonodactyla* (D. & S.) — Dean Point, St Keverne (1) 19.ix.87 — FHNS
1503 *P. ochrodactyla* (D. & S.) — Holt (50) bred tansy — B. Formstone per HNM; Saffron Walden (19) 5.viii.87 — AME
1511 *Pterophorus fuscolimbatus* (Mann) — near Coverack (1) — FHNS, *Ent. Gaz.* **39**: 187, Larval description & life-history, *Ent. Gaz.* **39**: 189-191
1522 *Leioptilus tephradactyla* (Hb.)—Melfort Cliffs (98) —MRY & RPK-J

Corrections to 1986 Review

(*Ent. Rec.* **100**: 118-130)

Argyresthia ivella	for 17.v.86 read 17.viii.85
Coleophora benanderi	for 30.vi.86 read 30.viii.86
Cochylis flaviciliana	for 16.v.86 read 16.viii.86
Dicrorampha sedatana	record should be deleted

Notes on British *Orthotomicus* (Col.: Scolytidae) including *O. suturalis* (Gyllenhal) new to Wiltshire

APART from the locally common *Orthotomicus laricis* (Fabricius) our two remaining representatives of the genus remain rare and are infrequently recorded despite the increasing afforestation of our countryside with conifers. I was pleased, therefore, to obtain a short series of *O. suturalis* (Gy.) from beneath the bark of a felled pine on the edge of Burnt Ground Wood, near Hamptworth, Wilts (SU 2217), on 1st April 1975. A singleton was taken in the same place and situation on 31st October 1975. I am not aware of a previous record from Wiltshire.

Joy (1932, *Handbk.Brit.Beetles*) omitted both *suturalis* and *erosus* (Wollaston) on the grounds that comparative material was required to effect accurate determinations, despite the fact that Fowler (1891, *Col.Brit.Islands,* **5**, 442) had provided useful diagnostic characters to separate the former (as *Tomicus nigritus* Gy.) from *laricis*. Duffy (1953, *Handbk.Ident.Br.Insect,* **5**, part 15: 16) includes all three species, separating them upon differences in the teeth of the apical declivity. I have not seen *erosus*, a species for which, as far as I can ascertain, there has been no published record since G.H. Thompson (1959, *Entomologist's mon.Mag.,* **95**: 95) reported its continued presence in the Forest of Dean, the site of its original discovery in this country as a breeding species. Duffy (*op.cit.*, 7) figures the more strongly developed, broadly triangular second tooth of the declivity in this species — a character which should enable the species to be readily distinguished from its allies. The separation of *suturalis* from *laricis* using the declivity characters as described by Duffy presented difficulties until I obtained examples of *suturalis*. Whilst the character given for *suturalis* by Duffy seems accurate, viz. "Distance between first and second teeth on elytral declivity less than distance between first pair of teeth", that for *laricis, viz.* "Distance between first and second teeth of elytral declivity greater than the distance between the first pair of teeth" is, in my opinion, needlessly confusing and somewhat inaccurate. In *laricis* it would seem from specimens that I have examined, that the two comparative distances are more-or-less *equal*. If this observation is borne in mind when using Duffy's key, no confusion should arise when attempting to name specimens. Finally, it should be noted that the size range given for *suturalis* by Duffy — 2-6.3 mm — is surely a printer's error for 2.6-3 mm — DAVID R. NASH, 266 Colchester Road, Lawford, Essex CO11 2BU.

As Mr Nash suggests, *O. suturalis* would seem to be a much under-recorded species, for which its omission from Joy's work may be in part responsible; probably therefore it still sometimes passes as *O. laricis*. Apart from that noted above, the only records of *suturalis* I have since the two early ones of Fowler are (in chronological order) for Bagshot (Surrey), Windsor Forest, and the New Forest (see Allen, 1951, *Ent.mon.Mag.* **87**: 115, where a few diagnostic notes found to be useful are given). It might be mentioned that Donisthorpe's Windsor records actually relate to the Swinley/Ascot area, but the beetle was present in some numbers in the bark of one or two pine logs in Windsor Forest proper in October 1971. — A.A.A.

THE IMMIGRATION OF LEPIDOPTERA TO THE BRITISH ISLES IN 1988

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[2] *1 Hardcourts Close, West Wickham, Kent BR4 9LG.*

IMMIGRATION in 1988 had a pattern rather similar to that in 1987, but in a much more extreme form. Influxes were frequent from January to June, but their numbers were small and almost confined to the common species. Things improved in late July and August and were followed by very large numbers from mid September through October, with some even in early November. *Cynthia cardui* L. was a dominant butterfly almost throughout. Other outstanding features were the large invasions of *Spodoptera exigua* Hb. and *Helicoverpa armigera* Hb., three more captures of *Thera cupressata* Geyer on the British mainland, the occurrence of four species of rare Plusiinae and a single *Catocala fraxini* L. Rare species of Pyralidae were also prominent. One of these, a specimen of *Sclerocona acutellus* Eversman, trapped by Col. D.H. Sterling at Leckford, north Hampshire on 8th August, is an addition to the British list, and a *Hellula undalis* Fab. taken by Mr A. Spalding in Cornwall on 21st October is only the second British record. Most of the scarcer species arrived in strong south west winds, probably from north Africa.

Cynthia cardui, after the Christmas invasion of 1987, made at least one influx in every month until October and even early November 1988. These, combined with the results of successful local breeding from July onwards, gave it a wider distribution and larger numbers than any since the "great year" of 1980. These are illustrated on the attached map (Fig.1) and on the table of monthly numbers covered by records which have reached us; (table 1) but these are certainly very incomplete. Larvae were also reported on thistles in several places on the south coast and informative sequences were traced as far north as Yorkshire at Muston (P.W. Winter) and Guisborough (N.W. Harwood). At the latter the first adult was seen on 13th June; on 14th and 17th July, 88 larvae were found in various stages from 1st instar to fully fed, and by 6th August, 178 had been counted in all; on the next day five adults were seen, together with three small larvae, and others, some still small, were being found until 21st September. Mr. Harwood gave RFB some of his pupae, but of those kept out of doors in Surrey only one emerged on 15th October and others were dead after the first frost on 20th and 21st October. In Scotland it was seen in six mainland counties to Aberdeen and Caithness, where full grown larvae were found. The numbers of *C. cardui* were as usual highest round the coasts, but there was good penetration in small numbers into Warwickshire and Worcestershire, and its occurrence on the northern outer islands of Canna, St. Kilda, South Uist, Orkney and Fair Isle is notable.

ENGLAND AND WALES

1. West Cornwall (with Scilly)	B	37. Worcestershire	C
2. East Cornwall	E	38. Warwickshire	D
3. South Devon	E	39. Staffordshire	
4. North Devon	B	40. Shropshire	
5. South Somerset	B	41. Glamorgan	A
6. North Somerset	C	42. Breconshire	A
7. North Wiltshire		43. Radnorshire	
8. South Wiltshire		44. Carmarthenshire	B
9. Dorset	E	45. Pembrokeshire	D
10. Isle of Wight	A	46. Cardiganshire	
11. South Hampshire	D	47. Montgomeryshire	
12. North Hampshire	A	48. Merionethshire	
13. West Sussex	D	49. Caernarvonshire	
14. East Sussex	D	50. Denbyshire	C
15. East Kent	D	51. Flintshire	
16. West Kent	C	52. Anglesey	
17. Surrey	C	53. South Lincolnshire	
18. South Essex	E	54. North Lincolnshire	
19. North Essex		55. Leicestershire	A
20. Hertfordshire	B	56. Nottinghamshire	A
21. Middlesex	C	57. Derbyshire	B
22. Berkshire	B	58. Cheshire	
23. Oxfordshire	B	59. South Lancashire	C
24. Buckinghamshire		60. West Lancashire	B
25. East Suffolk	A	61. South-east Yorkshire	E
26. West Suffolk		62. North-east Yorkshire	C
27. East Norfolk	A	63. South-west Yorkshire	
28. West Norfolk		64. Mid-west Yorkshire	
29. Cambridgeshire		65. North-west Yorkshire	
30. Bedfordshire		66. Durham	
31. Huntingdonshire		67. South Northumberland	
32. Northamptonshire	C	68. North Northumberland	B
33. East Gloucestershire	B	69. Westmorland	B
34. West Gloucestershire	B	70. Cumberland	
35. Monmouthshire		71. Isle of Man	A
36. Herefordshire		113. Channel Isles	E

SCOTLAND

72. Dumfrieshire	A	94. Banffshire	
73. Kirkcudbrightshire	A	95. Moray	
74. Wigtownshire		96. East Inverness-shire	
75. Ayrshire	B	97. West Inverness-shire	
76. Renfrewshire		98. Argyll Main	B
77. Lanarkshire	B	99. Dunbartonshire	A
78. Peebleshire		100. Clyde Isles	
79. Selkirkshire		101. Kintyre	
80. Roxburghshire		102. Islay, Jura	
81. Berwickshire	A	103. Mull, Coll, Tiree	
82. East Lothian		104. Skye, Canna, Rhum	B
83. Midlothian		105. West Ross	A
84. West Lothian		106. East Ross	
85. Fifeshire		107. East Sutherland	
86. Stirlingshire	B	108. West Sutherland	A
87. West Perthshire		109. Caithness	B
88. Mid Perthshire		110. Outer Hebrides	A
89. East Perthshire		111. Orkney Islands	C
90. Angus	C	Fair Isle	A
91. Kincardineshire		112. Shetland Islands	
92. South Aberdeenshire	A	St Kilda	A
93. North Aberdeenshire			

continued . . .

IRELAND

H.1.	South Kerry	D	H.31.	Louth	A
H.3.	West Cork	E	H.33.	Fermanagh	A
H.4.	Mid Cork	B	H.37.	Armagh	B
H.6.	Waterford	A	H.38.	Down	B
H.12.	Wexford	A	H.39.	Antrim	A
H.21.	Dublin	A	H.40.	Londonderry	A

Table 1. Distribution of *Cynthia cardui* records by vice-county.
Key: A = 1-3; B = 4-11; C = 12-31; D = 32-99; E = over 100

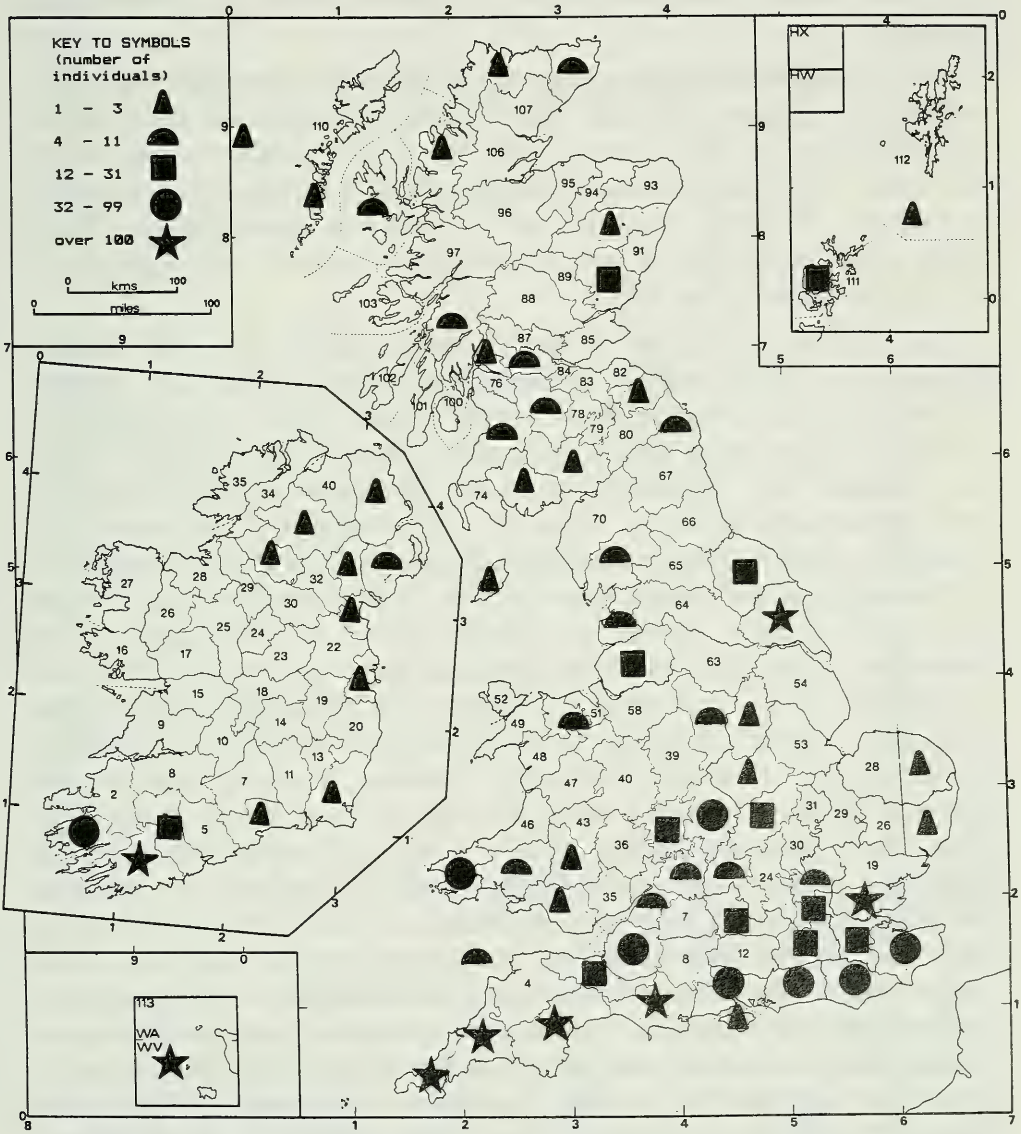

Fig. 1. Distribution of *Cynthia cardui* records, December 1987, plus all 1988.

By contrast, *Vanessa atalanta* L., though widespread, was in many places much less numerous than *C. cardui* until it made up its frequency by large immigrations and some local breeding from late July onwards. Several were seen in January and February, but the usual invasion in late May and June was small. It was last seen at Modbury, South Devon on 27th November. In the far north, three were seen on Fair Isle on 25th May and again in July and last on 27th October.

Colias croceus Fourc. was, as one recorder said, "Virtually non-existent", with only 17 reported. The first was at Kennal Vale, West Cornwall (AS) on 13th April, the last also there on 6th November. The counts by totals were South Devon (5), West Cornwall (4), South Hants (1), West Sussex (5) and East Sussex (2). With one exception, all were single sightings.

The diurnal *Macroglossa stellatarum* L. also had a very poor year, with only about two dozen reported, widely scattered in place and dates: Dorset (7), South Devon (4), Guernsey (3), Sussex (2), singles in East Kent, Berkshire, Northamptonshire, Middlesex (at light in North London), and far north at Hoghton, South Lancashire. The first was at Bigbury, South Devon, 24th April (Prof. J. Owen); the last in Guernsey with singles on 1st and 23rd November (per RA).

The common immigrant moths tabulated mostly show the feature, characteristic of this season, of absence or scarcity in the early months followed by large increases from August onwards (Fig.2). They probably understate the reality of this, because many recorders reported them simply as "common" or "abundant" in months of abundance, which have not been numerically tabulated. There are no indications of successful local breeding, except perhaps for *Autographa gamma* L. and *Plutella xylostella* L. Inspection of daily dates, agreeing with those of scarcer species, shows that most of them arrived in separate waves in mid August, early September, again in its third week, and most numerously in the second half of October, with a final small influx about 7th November. Though their peak dates varied somewhat, most species thus reached total numbers around normal. *Peridroma saucia* Hb., however, was always scarce, with less than 30 reported. After two at Peacehaven, East Sussex on 24th and 25th March, and one in June (CRP); it was not noted again until 4th September at Ringwood, South Hants. Inland, it was seen only singly at Fernham, Berks and Charlecote, Warwickshire. The last was at Penzance, West Cornwall on 28th November, the only record there (MPS). *Agrotis ipsilon* Hufn., first seen on 15th March at Fernham, Berks (SN), was scarce in the spring but its numbers rose more steadily than those other common species to a good peak of over 200 in October and it was still widespread in November with the last on 18th November at Bradwell-on-Sea, South Essex (SD). Inland it was seen in South Wilts, Middlesex, Surrey, Herts, and Warwickshire; its northern limit on the coast was Orkney, with one in

	Cynthia cardui	*Vanessa atalanta*	*Colias croceus*	*Macroglossum stellatarum*	*Agrotis ipsilon*	*Peridroma saucia*	*Autographa gamma*	*Udea ferrugalis*	*Nomophila noctuella*	*Plutella xylostella*
18 December 1987 - 8 January 1988	30	1	0	0	0	0	0	1	0	0
January 16/31	7	2	0	0	0	0	0	0	0	0
February	4	4	0	0	0	0	0	0	0	0
March	18	6	0	0	24	2	1	0	6	80
April	39	5	1	1	19	0	0	0	11	5
May	338	79	1	1	20	0	63	2	13	46
June	135	77	0	3	10	1	132	0	3	c.120
July	254	55	3	7	43	1	725	0	30	44
August	282	155	1	6	101	0	2042	1	153	7
September	191	171	6	3	62	12	1467	5	408	31
October	57	95	2	1	221	9	1177	136	1184	11
November	28	24	3	0	21	3	33	6	22	0
December	0	0	0	0	0	0	0	0	0	0
TOTALS	**1383**	**674**	**17**	**22**	**521**	**28**	**5640**	**251**	**1830**	**343**

Fig. 2. Numbers of commoner immigrant Lepidoptera in 1988 (Dateable records).

June and three in October (RIL). *Autographa gamma* L., after one found in a house at Bromley, West Kent on 9th March (S.N.A. Jacobs), began fairly strongly as usual in May and June, reached an early peak with over 1900 dated records in August, and remained numerous in many places until November, when the last were seen at Bramley, Surrey on 28th and 29th November (RFB). It was reported in eleven inland counties or vice-counties north to Montgomery, in small numbers, and on the coast to Fair Isle, B.O., where 20 were counted between 26th May and 20th October (per PMP). This may be compared with the combined total of 3083 scored at two traps at Bradwell-on-Sea, South Essex from 8th May to 15th November (AJD, SD). As a whole a fair but not outstanding year.

Of the usually abundant micro-lepidoptera *Nomophila noctuella* D. & S. was below normal. It was first seen singly at Bradwell-on-Sea, South Essex, on 23rd March; but there were then only a handful of records, and many comments on its unwonted absence or scarcity until late July. It only began to show large numbers in late August and September, reached its peak in October, with a few more until the last on 12 November at Cusgarne, West Cornwall (AS). It reached both Orkney and Fair Isle in September and also Argyll, and it was reported from ten inland counties and vice-counties as far north as Warwickshire and Northamptonshire, but numbers were everywhere small. It was also reported from Co. Cork Mid, and in some numbers in Guernsey. *Udea ferrugalis* Hb. was first noted at Cusgarne, West Cornwall, on 25th May (AS), but there were no more until mid August, and it only became common in October, when it occurred round the coast from North Somerset, Isles of Scilly, to East Kent and South Essex, with the most northerly at Spurn Point, Yorkshire. Inland, it was only reported from Warwickshire. Its last was on 22nd December, also at Cusgarne (AS). *Plutella xylostella* L., which is believed to be both resident and immigrant, was not much reported, and the records show a date pattern unlike that of the other species discussed. They began with a swarm of over 80 at Fernham, Berks, 15th/25th March, and there was another of nearly 40 there 7th/15th May (SN). Otherwise, it was reported only in coastal counties from South Hants, East Sussex, East Kent, East Suffolk, and at Spurn Point, Yorkshire, where there were "hundreds" on 13th June (BRS). It also reached Orkney in July, and two were seen on Fair Isle on 17th and 30th June. Inland, besides Berks it was noted in North and South Wilts, North Hants, Surrey and Cambridge. It was last seen at Muston, Yorkshire on 22nd October, but was not numerous in England after August. In Guernsey, however, there were six in October and one on 10th November (per RA).

The scarcer species are fully detailed in Annexe II. The total of 70 wholly immigrant species is not outstanding, but the numbers of individuals of many of them were much above average. *Helicoverpa armigera* with 78 had many times the highest annual total previously known. *Spodoptera exigua*

with nearly 200 was more plentiful than in any previous year since 1962, when there were over 1,000 reported; but then it arrived in force in May and is supposed to have bred extensively, whereas in 1988 the influxes began only in late July and there are no indications of successful breeding. *Palpita unionalis* Hb. had a good total of 40 recorded. *Rhodometra sacraria* L. with about 100 was above normal but did not approach the enormous total of 1987; but *Orthonama obstipata* Fab., which often comes with it had 60 recorded to compare with the very few in 1987. *Agrius convolvuli* L., however, was very scarce in 1988.

Two rare immigrant species of other insect orders may also be mentioned. Of the Odonata a dragon fly, *Aeschnea cyanea*, was found in Cork City on 18th October after a night with "Sahara dust": a new species for Ireland. Of the Orthoptera, a Desert Locust, *Schistocera gregaria*, was taken from a wall at Herne Bay, East Kent on 10th November (Jill Morris per T.W. Harman), which is said to be the first known in Kent. In Devon and Cornwall, 36, and one in Somerset were counted between 26th October and 7th November (per A. Spalding). Their dates coincided with the many scarce Lepidoptera which had clearly originated in north Africa.

We are very grateful to our still increasing numbers of recorders both direct and indirect, and we are especially indebted to those who sent in detailed results of nearly continuous records over much of the season, such as M. Rogers at Portland Bird Observatory, Dorset and A.J. and S. Dewick at Bradwell-on-Sea, Essex. We have also used many of the *C. cardui* records supplied in answer to an independent appeal in a BBC. Ceefax programme. We again draw attention to our use of the long recognised boundaries of counties and vice-counties as the basis necessary to maintain long term continuity in the face of the many changes in administrative areas.

(To be concluded)

A Second Kent County Record for *Tomoxia bucephala* Costa (Col.: Mordellidae)

A SINGLE example of *Tomoxia bucephala* was found by chance on a rotting birch stump at Hothfield Common Nature Reserve (TQ 969457) on 7.6.87. As warden of the site I was accompanying a visiting party of botanists and as they stooped to examine heath rushes my attention was attracted by this beetle on a stump (left after heathland reclamation work).

Despite very many hours spent on the site no further records have been made. My thanks to E. Philp of Maidstone Museum for confirming the determination and allowing me access to the County Biological Archive which made its status, as a second county record, clear. — N. ONSLOW, 1 Windmill Close, Willesborough, Ashford, Kent TN24 0AU.

The Beautiful Brocade *Lacanobia contigua* (D. & S.) (Lep.: Noctuidae) in Suffolk in September

IN BRITAIN, the Beautiful Brocade is allegedly a univoltine species, on the wing as an adult in June and July when it may be taken freely both at light traps and at the sugar patch. Its distribution, as reported in *The moths and butterflies of Great Britain and Ireland* volume 9, page 217 (Harley Books, 1979), is essentially southern and western, with a belt of records extending south-western from Surrey to the Isle of Wight and with scattered records from west and north-west England, Wales and Scotland. For East Anglia there is one dot in ?Cambridgeshire and two for Norfolk. It was, therefore, a complete surprise to discover that an extremely worn female noctuid (which could only really be identified as far as belonging to the Hadeninae on the basis of its hairy eyes), which I took in the shadow of the Sizewell nuclear power station in Suffolk on 10th September 1988 proved to be *Lacanobia contigua* on examination of the genitalia.

Though captured on the thin strip of land between a conifer plantation and arable fields the moth was in fact found in suitable habitat. The soil here is largely sand, being only a short distance back from the dunes of the coast and there is no doubt that both conifers and fields lie on former heathland. Small patches of this heath remain and are invaded by scattered trees — hence the habitat for this moth is near perfect. However, the extremely late date is a mystery. For Europe, Jules Culot writing in 1909 (*Noctuelles et Géomètres d'Europe* volume 1, page 103), also states that the adult flies in June and July and makes no mention of second broods, so this is no help. In the absence of other immigrant species at that time, the inevitable conclusion to which one is, therefore, drawn is of a late emerger from July that has survived birds and weather to reach the ripe old age of two months! Possibly the poor weather of 1988 may have delayed emergence to beyond the normal time? — COLIN W. PLANT, Passmore Edwards Museum, Romford Road, Stratford, London E15 4LZ.

Unusual insect diets

THE EDITOR's experience of finding *Hofmannophila pseudospretella* Stt. larvae feeding on slug pellets (*Ent.Rec.* **101**: 89) recalls an incident in the seventies. Returning to my laboratory after the vacation, I opened a large rubber formaldehyde tank containing dogfish floating in 4% formalin solution. Some of the bodies had been partly dissected, and the sides of the tank were covered with a grey deposit of evaporated (? and polymerised) formaldehyde and fishoil, above the tideline. Resting on this unsavoury mass were over 100 freshly-emerged moth flies (*Psychoda* sp.). This struck me at the time as being a remarkable diet for even these lovers of unpleasant pabula. (They are often found in numbers on sewage filter-beds). — E.H. WILD, 7 Abbots Close, Highcliffe, Christchurch, Dorset.

MESAPAMEA REMMI REZBANYAI-RESER, 1985. (LEP.: NOCTUIDAE) A SPECIES NEW TO BRITAIN

M.J.R. JORDAN

46 Branson Road, Bordon, Hants.

THIS SPECIES was first discovered amongst specimens of the genus *Mesapamea* taken in Switzerland during 1983-1985 (Rezbanyai-Reser 1985). It is apparently very rare, Rezbanyai-Reser finding only nine specimens of *M. remmi* from over 2000 *Mesapamea* specimens examined.

Subsequently several other specimens have been identified from Germany, but the total number so far found remains very low (Meineke & Rezbanyai-Reser 1986).

Whilst conducting work on the species pair *Mesapamea secalis* L. and *M. didyma* Esp. (=*secalella* Remm) in Britain, three specimens of the previously unrecorded *M. remmi* have been found. All three were caught at m.v. light at Weyhill, Hampshire (vc 12).

One female, form *rufa-flavo* on 4.viii.1984, another female f. *rufa-flavo* on 30.vii.1985 and one male f. *nictitans* on 13.vii.1985.

This third species in the *secalis* complex is separable only by the genitalia, although a feature of the female genitalia may be visible externally on the underside of the abdomen.

The genitalia of *M. remmi* are now described and compared to those of *M. secalis* and *M. didyma*. For a more detailed account of the genitalia of the latter two species see Jordan (1986).

Male genitalia

The aedeagus is the most diagnostic structure for identification. It is shorter, stockier and straighter (fig.1) than in *M. secalis/didyma* (figs.2 and 3). On the everted vesica the large cornutus arises laterally (fig.4), unlike *M. secalis/didyma* in which it hangs ventrally (figs.5 and 6), and differs in shape from either of those species. Adjacent to the large cornutus are many smaller cornuti which are, however, very much larger than those of *M. secalis* or even those of *M. didyma. M. remmi* lacks the small accessory pouch present in *M. secalis.*

The clavus region (fig.7) most closely resembles that of *M. didyma*, but protrudes less and lacks the fine setae found in that species.

Female genitalia

The female genitalia are very different from other species in the genus. The large chitinised ridges leading to the opening of the ostium are very obvious and distinctive (fig. 8), these ridges are visible on the ventral surface of the abdomen without dissection. Rezbanyai-Reser (1985) shows a photograph of a female abdomen prior to dissection.

There is no obvious swelling present in the ductus bursa, and the bursa

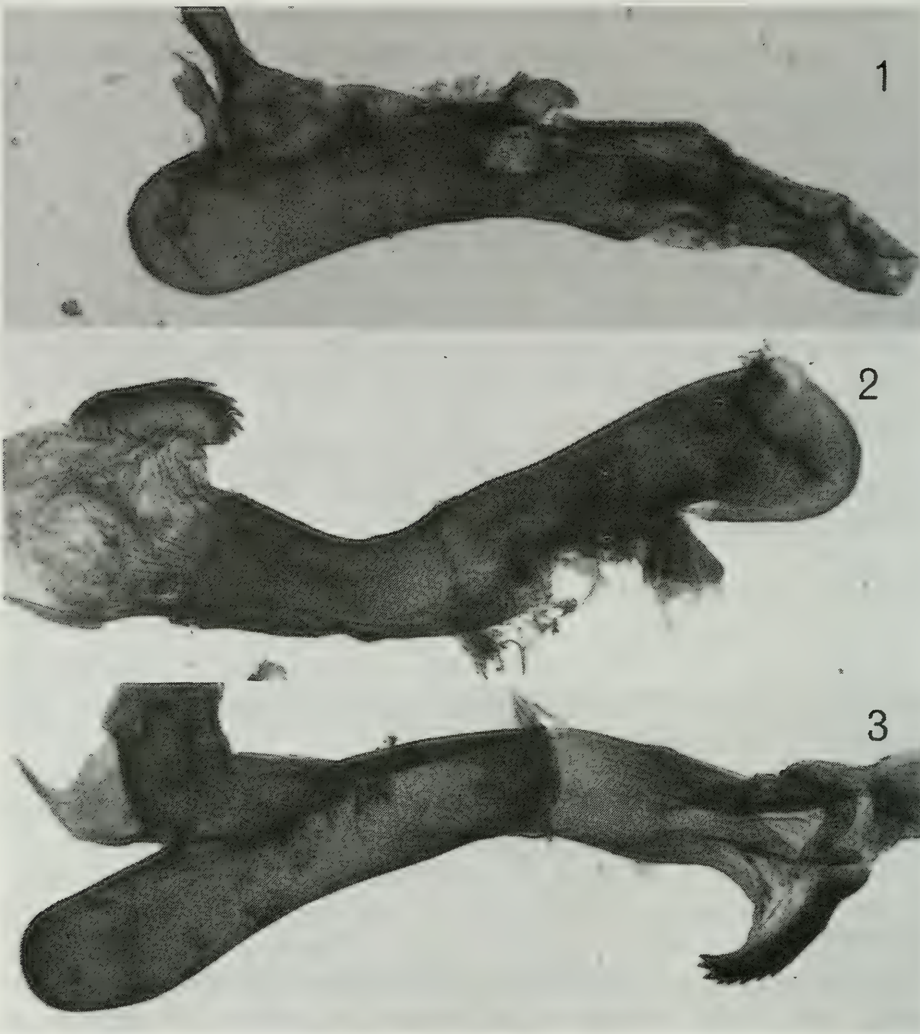

Fig.1 *Mesapamea remmi*: aedeagus x25
Fig.2 *Mesapamea secalis*: aedeagus x25
Fig.3 *Mesapamea didyma*: aedeagus x25

copulatrix is highly convoluted, having many folds and a large pouch all of which are unlike *M. secalis/didyma*.

The male and female genitalia described are only associated by frequency of occurrence and have not been linked by captive breeding. However with this species, which is probably as difficult to rear as the other members of the genus, captive breeding is unlikely.

Fig.4 *Mesapamea remmi*: everted vesica showing cornutus x50
Fig.5 *Mesapamea secalis*: everted vesica showing cornutus x50
Fig.6 *Mesapamea didyma*: everted vesica showing cornutus x50


4


5


6

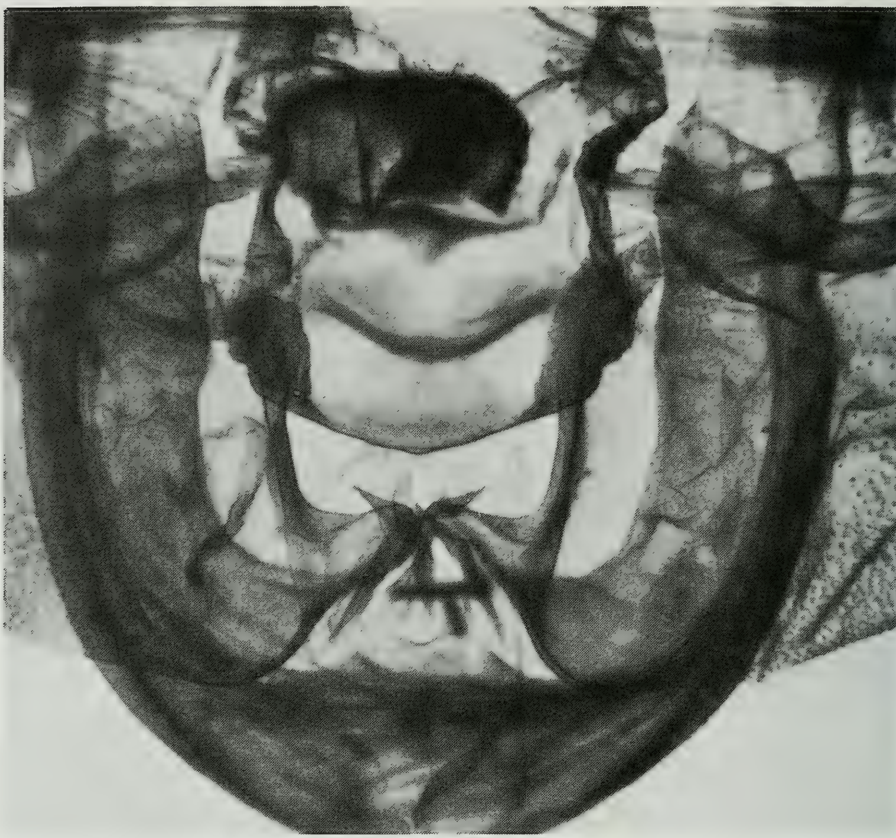

Fig.7 *Mesapamea remmi*: detail of clavus x 50

Virtually nothing is yet known about its biology and the capture sites on mainland Europe and the Hampshire locality are very different in climate and habitat.

In all of the localities that it has so far been found *M. remmi* occurs at a very low density. The three Hampshire specimens were found amongst a random sample of over 600 *Mesapamea* specimens checked by genitalia dissection, hence *M. remmi* represents only 0.5% of the total *Mesapamea* sample.

It has not yet been found at any other locality in Britain despite numerous *Mesapamea* specimens being checked.

It appears most likely that this species is a very low density resident and other specimens and localities will probably be found in the future, particularly by individuals undertaking large scale work on the genus for recording purposes.

Whilst the female genitalia are very distinct and unlikely to be confused, particular attention should be taken to any male *Mesapamea* specimens which upon initial dissections do not conform to either of the other British species and reference made to the aedeagus of any such specimens to confirm their identity.

Fig.8 *Mesapamea remmi*: chitinised ridges at entrance to ostium x50

Acknowledgements

Many thanks to M.R. Honey of the British Museum (Natural History) for allowing me access to facilities and for all his useful comments.

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Caloptilia elongella L. (Lep.: Gracillariidae) on a previously unrecorded foodplant

Whilst carrying out a breeding programme of Gracillariidae species last year, I collected tenanted larval workings of *Caloptilia elongella* in the leaves of common alder (*Alnus glutinosa*) in Colwick Country Park, Nottingham. A few days later at the same site I noticed two leaves of grey alder (*Alnus incana*) showing typical feeding of *elongella* — epidermal mines on the upperside of the leaf, leading to puckered blotches over the veins, with one of the leaves having the typical downward roll.

Neither Heath (*The moths and butterflies of Great Britain and Ireland* **2**), or Emmet ((1988) *A field guide to the smaller British Lepidoptera*) give *Alnus incana* as a foodplant for *elongella*. My thanks are due to Col. A.M. Emmet for confirming my identification. — A.S. BOOT, 38 Balmoral Road, Colwick, Nottingham NG4 2GD.

Schrankia intermedialis Reid (Lep.: Noctuidae), the autumn snout, in Kent.

A SINGLE male of this species was caught in the Rothamsted Insect Survey light trap operating near Fagg's Wood, Warehorne, Kent (Site No. 478, O.S. grid ref. TQ 988 346) on the night of 23/24.ix.1988 and was determined by examination of the genitalia. The identification was subsequently confirmed by J. Reid.

Only four other specimens are known to science, all of which were caught in Hertfordshire (Skinner, B. (1984) *Colour identification Guide to Moths of the British Isles.* Viking, Harmondsworth) therefore the present record represents a significant increase in the known distribution of this species.

There is speculation that *Schrankia intermedialis* is merely a naturally occurring hybrid of the closely related *S. taenialis* Hübner and *S. costaestrigalis* Stephens. It may be relevant to this discussion to note that the genitalia of the five known specimens are very constant in form; variation being limited to very slight differences in the breadth of the valves (Reid, pers. comm.). Over the two years it has been operating, neither of the other *Schrankia* species have been caught in the trap, although both have been recorded from the Ham Street Wood complex (Chalmers-Hunt, J.M. (1962-68) *The Butterflies and Moths of Kent*, Vol. 2, pp. 347-348) and Skinner (pers.comm.).

Thanks are extended to Jim Reid for his observations on this species and for confirming the identification of the Kent specimen; Neil Davies who operates the Warehorne trap and to Bernard Skinner for his helpful comments. — ADRIAN M. RILEY, Dept. of Entomology and Nematology, AFRC Institute of Arable Crops Research, Rothamsted Experimental Station, Harpenden, Hertfordshire AL5 2JQ.

SOME COMMENTS ON THE BRIMSTONE MOTH (*OPISTHOGRAPTIS LUTEOLATA* L.) (LEP.: GEOMETRIDAE)

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IN 1960 and 1961 the life cycle of this insect was the subject of a number of papers in the Journal; none was based upon direct observation or experiment and conclusions reached were founded upon circumstantial evidence as given in various textbooks, and the correct interpretation was taken to be that enunciated by Barrett (1900). The latest textbook by Skinner (1984), states that in southern Britain ". . . the species produces three broods over two years with the result that the adult appears in every month from April to October . . .". This is in fact a description of a bivoltine insect's life cycle from the standpoint of a single pair of specimens (a male and female) whose progeny will fly in only some of the months from April to October in each of the two years, but covering all the months over the two year period. The species, as opposed to a single individual, has six emergence periods over two years due to the insect passing the winter as both a larva and as a pupa. From over-wintered pupae imagines emerge in April and May (gen. Ia) while the hibernated larvae feed up in Spring to produce moths in June and July (gen. Ib). A strong second brood (gen. II) appears in August, basically from individuals of gen. Ia, but as there is some overlapping in some years of the two sections of the first generation the situation is not quite straightforward.

Bretherton (1961) proposed that the "bivoltine race" consisted of two strains, a univoltine strain (mid-June to mid-July) which matured slowly, and a true bivoltine strain (May-June and August-September); this theory would require that the over-wintering larvae were associated with the mid-June to mid-July moths, and that the hibernating pupae came from the second brood moths.

I do not really find this theory plausible. Firstly in the Highlands of Scotland where *luteolata* is essentially single brooded appearing in June and July, the larvae feed up and the winter is passed in the pupal state — this is my experience from breeding numerous feral larvae from the rowan trees (*Sorbus aucuparia*) in August; despite the pupae being kept indoors no moths emerged until the following Spring. Lanktree (1961) details the light-trap records for *luteolata* at Kincraig, made by Dr C.B. Williams, which indicate that at that locality in some years there is a small, partial second brood; it would be interesting to know how the larvae of these second brood moths behave — is there time for them to feed up to attain the pupal state, do they hibernate as larvae, or do they just die? Secondly, in southern Britain it seems more likely that the gen. Ib moths would give rise to caterpillars that would feed up to pupate the same year, and the gen. II moths produce offspring that would remain as larvae during the Winter, simply by virtue of the respective time available.

In 1986 and again in 1988 I obtained eggs from gen. II moths. In 1986 the caterpillars were reared indoors, they showed very irregular growth as between individuals and there was considerable mortality; however, a few gen. III specimens were obtained in late October and November — they resembled those of gen. II but were inclined to be slightly smaller, and some were a little paler. In 1988 two broods were kept outside in cooler conditions; from the start the larvae showed little inclination to feed, and by November all had died, perhaps due to the use of plastic boxes not supplying satisfactory conditions. This does suggest that it is the gen. II moths which produce hibernating larvae; suggest, not prove!

Of the life cycle of *luteolata* in Ireland virtually nothing seems to be known; I believe even its larval foodplant remains a mystery. Bradley and Pelham-Clinton (1967) summarise much of what is known about the moths found in Co. Clare, and they note that *luteolata* is very common at Ballynalackan and Newtown Castle in May and June, and September, but there is no mention of the larva. I have observed the moth at Rinnamona, Co. Clare, as early as 26.v.1988 and 28.v.1987; also in late June, 25.vi.1987; in late July, 30.vii.1987; and in late August, 29.viii.1987. Outside the Burren I have noted the moth at Pontoon, Co. Mayo, 27.vi.1987. However, despite beating hawthorn, blackthorn and hazel for larvae in late May and early June, *luteolata* has not been amongst the species obtained. The dates given for the moth in the Burren indicate that perhaps the moth's life cycle there is similar to that in southern England.

An aspect of the Brimstone Moth that has received very little comment is the actual appearance of the insect, for it is a polymorphic species. However, Barrett does state that the June moths ". . . are always finer in colour and markings that those of the other two broods . . .". In N.W. Kent there is certainly a degree of seasonal polymorphism. The gen. Ia and gen. II moths are usually smaller than those of gen. Ib, perhaps not surprising in view of the latter having the advantage of the larvae completing their growth upon new, young foliage in the Spring. Gen. Ia specimens tend to be the most weakly marked, many lack the brown dots at the end of the veins, while the apical brown mark is frequently broken, and the transverse lines are less pronounced, culminating imperceptibly in ab. *delineata* Lempke, in which they are absent. I have found ab. *apicolutea* Cockayne mainly in gen. Ia, and in 1988 several appeared in my garden trap. In this form although the apical blotch is absent, the postmedian line still supplies its ingredient of the mark by reaching the costa. The much rarer ab. *emaculata* Graeser, in which this fails also, I have never encountered.

The gen. II moths in N.W. Kent are basically similar in size to those of gen. Ia, but include a larger proportion of even smaller individuals. Gen. II moths appear to be the commonest at light, although most of the specimens I find attending are settled on the surrounding herbage, but only

if the area is examined soon after dawn; sparrows will quickly remove all evidence of their presence, helped by the occasional blackbird, which arrives first on the scene. These late summer moths are usually very conspicuously marked with bold transverse lines, a well marked apical blotch and brown dots at the vein ends — a variable feature. It is in this brood that ab. *ruficosta* Lempke, in which the brown marks along the costa tend to coalesce, is usually found; although not uncommon, I find extreme forms distinctly rare.

In the artificial gen. III individuals, this form appears to be no commoner, indeed it seems to be less so, with the markings in general being weaker, yet not being similar to those of gen. Ia.

Regarding the June-July moths from winter larvae Barrett's comment that they are always finer in colour and markings than those of the other two broods is very near the truth; in general they are larger and the occasional giant specimen generally comes from this brood. Markings tend to be intermediate. The Scottish June-July, single brooded insects from winter pupae on the other hand, though comparable in size with the bivoltine gen. Ib moths regarding size, appear to be very slightly paler.

With ab. *ruficosta* being particularly associated with the second brood it seems that there might be a climatic or other factor modifying the effect of the gene(s) causing it. What is its incidence among the single brooded population? I hesitate to suggest a particular association of other named forms with a particular brood.

At some stage of a note referring to Kentish lepidoptera I find it expedient to quote Chalmers-Hunt (1981), but apart from the recording of three genuine larval foodplants, *luteolata* seems to have received somewhat scant attention; some aberrations are noted, but often without complete data; Curiously ab. *ruficosta* is noted only from an extreme example from Folkestone, date not given, although apparently it was caught 13.viii.1956 (Morley, 1957); how useful this additional information is, but unfortunately the same paragraph mentions a specimen of ab. *emaculata*, but in this case the original source of the information omits the date. In view of the paucity of named forms being given by Chalmers-Hunt I quote the following, taken by me at Dartford: *intermedia* Harrison (very pale whitish yellow) 3.v.1979, 12.ix.1987: *apicolutea* 13.ix.1986, 13.v.1988 and 16.v.1988; *nebulosa* West 7.vi.1979 (a banded form); *ruficosta* 16.viii.1974, 8.ix.1985, 10.viii.1985, 16.viii.1988 and 27.viii.1988.

The textbooks which give the flight period of *luteolata* as April to October for bivoltine populations are not conveying a really accurate picture. My garden m.v. trap has now been in operation for twenty years; 17.iv.1988 and 7.x.1986 represent the only occasions when a specimen has been noted in April or October. R. Bretherton (1961), detailing light trap records at Ottershaw, Surrey, over a nine year period from 1952 to 1960, noted one specimen for April and one for October. This suggests that these

two months should be omitted from being part of the moth's normal flight period. Although the odd early October sighting probably merely represents a survivor, one later might suggest it has derived from a gen. Ib pairing, or even more likely a cross pairing of gen. Ia and Ib, rather than it being a true third brood individual of gen. II parentage.

Because the gen. Ib moths are intermediate in appearance, though not in size, it is not always possible to differentiate specimens of different broods where these overlap; however, the August-September brood generally appears to commence a week or so after the June-July insects have tailed away. Bretherton writes that there are two main periods of abundance at Ottershaw, the first, varying with season, begins with the first hot spell in May, the numbers remaining high for about three weeks and then declining steadily through the second half of June and most of July, until a nadir is reached in the last week of July. The second period, also varying with season, occurs in August and early September, but comes to a more abrupt end in the second or third week of September; on average this brood is half as big again as the combined first broods. The Ottershaw findings are from a sheltered location on a light, well-drained soil; my records for Dartford are from a sheltered, but north facing location situated on clay. However, the two have produced almost identical results. The one difference appears to be that at Dartford a higher proportion of gen. II moths have been noted in the second and third weeks of September, and the end of the brood has not developed quite so abruptly. Using the same dates for the weeks as were used for Ottershaw I give my figures for Dartford in 1988. Before the second week of June records are incomplete due mainly to my absence, but in this period the first moth noted was on 17th April; a complete second week in May produced seven moths; June — n/a, 8, 6, 7; July — 1, 7, 6, 4; August — 5, 39, 36, 35; September — 52, 12, 16, 0.

Perhaps the second brood in 1988 was relatively larger than usual, but excepting the presence of the April specimen, 1988 was not an atypical year for *luteolata*. 1976 on the other hand was atypical with *luteolata* attending the trap from 7th May until the 29th, not to be seen again until 27th July, despite the trap being in operation throughout June and July. In 1984 the light was not used in May, except on two nights, due to weather conditions, and *luteolata* was not observed until 5th June. Moths then appeared regularly until the 18th, but the next specimen did not arrive until 13th August, after an interval of almost two months, and 2nd September saw the last.

Heslop-Harrison (1955) and Campbell (1971) provide evidence that *luteolata* on some of the islands of the Inner Hebrides have two emergence periods (not three as with the bivoltine population of southern Britain). Referring to a period of years, Campbell states that on Canna the moth is common and double brooded, the earliest date being 10th May and the latest 18th September. For Canna, Rhum, Eigg, Soay and Raasay, Heslop-Harrison writes "... It is quite possible that two species are involved here

as one series winters as pupa and the other as larva; the latter group, emerging in August, produce larger more distinctly marked imagines . . .''. So it appears, assuming only one species is involved, that moths emerge in May and June from overwintered pupae (gen. Ia) and the later moths described as being larger and more distinctly marked (gen. Ib) form an apparent second brood, but are not the progeny of the May-June moths. Thus there seem to be two distinct strains, the smaller, early moths overwintering as pupae, the larger later moths having insufficient time for their growth by the Spring. It is undoubtedly a population worth further investigation.

Another aspect of the Brimstone Moth about which little is known is its larval foodplants; Barrett has been the source of most of the information that has appeared in textbooks after his monumental work. He listed hawthorn as the main foodplant (probably true of much of England and Wales), occasionally on blackthorn and apple, and more rarely on other fruit trees, wild service, whitebeam and hazel (unfortunately, it is not certain that foodplants listed by Barrett refer to Britain). Subsequent authors appear to have copied Barrett but curtailed the list and added an *et cetera.* In Kent I have often found the larva on hawthorn (*Crataegus monogyna*) and occasionally on blackthorn (*Prunus spinosa*) which I believe is the main foodplant there. Chalmers-Hunt for Kent refers to the larva being found frequently on hawthorn, blackthorn and rowan. L. and K. Evans (1973) for N.E. Surrey, without giving frequency, list plum, oak, snowberry and wayfaring tree. Lorimer (1983) states that rowan is the main foodplant in the Orkney Islands. Finally the Inner Hebrides — Campbell reports that on Canna the larvae are found on alder; Heslop-Harrison lists that on Eigg, Rhum and Canna it is found on hawthorn, laurel, etc., rowan and other trees on Raasay, and birch on Soay. Thus it seems that on these islands the insect may have a number of larval foodplants of equal significance, unlike elsewhere. How unfortunate that ''the other trees'' and ''etc.'' must for the time being remain undetected, and that perhaps a most important contribution to our knowledge of the life cycle of *luteolata* should be marred by incomplete recording. There may be contributions to our knowledge of the subject with which I am not acquainted, especially in literature dealing with local areas, although many so-called ''county lepidoptera'' are merely check lists of limited merit by virtue of their narrow interest, but others may be even worse, being largely fictional in character, especially in relation to larval foodplants. Nevertheless it does seem that we have knowledge of this subject from only a very small part of these islands — a tiny bit of S.E. England, the Highlands of Scotland, the Orkneys and the Inner Hebrides! These four areas alone have shown there to be a most interesting diversity in more than one aspect of the natural history of the Brimstone Moth, and the references to contributions in this journal and to the separately published works dealing with local areas

illustrate how useful such sources of information can be. However, from the River Thames to the Highlands of Scotland, and from the coast of East Anglia to the west coast of Ireland, there lies an enormous area of uncharted territory where *luteolata* flies but where its life history remains a mystery.

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Flight behaviour of *Anarta melanopa* Thunb. (Lep.: Noctuidae)

ON May 27th 1970 I walked over the high ground of the Monadhliath Mountains of Inverness-shire hoping to find this moth flying in the sunshine or to kick specimens up during the cloudy interludes. Despite considerable sunshine in the late morning only a couple of moths were seen but were immediately swept up by the very strong and gusty north-west wind and down over the heather-clad slopes beyond. After a considerable time, unsuccessful in my quest for *melanopa*, I sat down upon a boulder for refreshment before departure. However, almost immediately I noticed a specimen a few feet away flying an inch or so above the vegetation, its flight and appearance resembling that of a small bee rather than that of a moth. It was easily captured, and I had no sooner sat down again than another was sighted, flying in similar fashion, and in a very short time by being seated or standing still a couple of dozen were observed in quick succession.

Strong wind is a persistent feature of the region (G. Manley, *Climate and the British Scene*, 1952), and *melanopa* has evolved a flight pattern enabling it to take advantage of the limited sunshine even when strong winds are blowing, by flying only in the zone immediately above the vegetation where the air is comparatively still. — B.K. WEST, 36 Briar Road, Dartford, Kent.

RECORDS OF *SCIOTA ADELPHELLA* (FISCHER VON ROSLERSTAMM) FROM NORTH KENT

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DURING 1987 I purchased a copy of Eivind Palm's excellent recent book on the Scandinavian Pyralidae (Palm, 1986). Whilst perusing the insects depicted on plate 1, my immediate thoughts were that the figures for two species had been transposed. These were *Sciota hostilis* (Stephens) and *Sciota adelphella* (F. von R.), since the two specimens which had long done duty in my collection as *S. hostilis* bore much more resemblance to the colour figures of *S. adelphella*, a supposedly non-British species (Meyrick, 1895). Recourse to the text figures in Palm on p. 39 did nothing to resolve the problem, neither did exhibition of the specimens at the Maidstone meeting of Kentish Lepidopterists during February this year.

Accordingly, I prepared a (male) genitalia slide of one of the specimens. This appeared closer to the rather poor figure of the genitalia for *S. adelphella* than to *S. hostilis* in Pierce and Metcalf (Pierce and Metcalf, 1937). I then submitted the two specimens to Mr M. Shaffer (Dept. Entomology, British Museum (Natural History)) who kindly confirmed that the specimens were indeed *S. adelphella* and also brought to my attention a recent paper (Brotheridge, Corley and Dewick, 1988) which records other overlooked British specimens of *S. adelphella*, together with figures and a description of this species.

The data for my specimens are:— (1) Newington, near Sittingbourne, Kent, 6.vii.1976, captured by my wife, Valerie at m.v. (2) Three Lakes, Murston, near Sittingbourne, Kent, 4.vii.1985 at m.v. It would be interesting to know the basis for the assertion by Meyrick that British records for *S. adelphella* are due to confusion with *S. hostilis*. It has possibly resulted in the species being overlooked in Britain for nearly a hundred years. The foodplants for *S. hostilis*, according to Palm are various species of *Salix* and *Populus* which are common in the localities where my specimens were captured, whereas the foodplant of *S. hostilis* (*Populus tremula*) is much less frequent in the North Kent coastal area. Certainly, any supposed specimens of *S. hostilis* with an orange basal area on the forewing which have been caught in an area where aspen is infrequent should be subjected to careful scrutiny. Palm states that *S. adelphella* has a predominantly coastal distribution in Scandinavia and it is tempting to surmise that the insect is breeding in the North Kent marshes where all of the species' recorded foodplants are abundant.

I shall now be looking for some genuine specimens of *Sciota hostilis* to fill the vacant space in my cabinet!

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Pandemis dumetana Treit (Lep.: Tortricidae) in Northumberland.

DURING sorting through a small collection of microlepidoptera, made during 1979, 80 and 81, mostly in Northumberland and Durham, I came across a single specimen of *Pandemis dumetana* Treit. The collection was compiled by Mr M.D. Eyre of the School of Agriculture, University of Newcastle-upon-Tyne. The insect is labelled "Rothley Lakes, 1-8-81, 0490". The last figure is the Ordnance Survey Map Reference, NZ 0490. The specimen has been seen and confirmed by Mr E.F. Hancock of Ulverston.

Since the known range of this species, according to Bradley, Tremewan and Smith, *British Tortricoid Moths*, Vol.1, p.99, is from the southern chalkland habitats to the Norfolk Fens, apart from a single site in Lancashire on Kirby Moss, it seems worth recording this unusual capture. — T.C. DUNN, The Poplars, Chester Le Street, Co. Durham.

Eupithecia valerianata Hübner (Valerian Pug) and _Eupithecia virgaureata_ Doubleday (Goldenrod Pug) (Lep.: Geometridae) in Breconshire.

A SINGLE female of *Eupithecia valerianata* Hb. and a single male of *E. virgaureata* Doubl. were caught in the Rothamsted Insect Survey light trap at Llysdinam, Powys (Site No. 111, O.S. Grid ref. SO 009 586) on 4.vii.1987 and 8.v.1987 respectively. In both cases identification was confirmed by examination of the genitalia.

According to Sankey-Barker, J.P. *et. al.* (1978. *Butterflies and Moths of Breconshire*. Brecknock County Naturalists' Trust) neither of these species have previously been recorded in the Watsonian vice-county and pre-1974 administrative county of Breconshire (now part of Powys). This has been confirmed by B. Skinner (pers. comm.). Both species are difficult to identify by means of superficial characters alone and have possibly been overlooked by previous recorders.

Thanks are extended to F.Slater who operates the trap at Llysdinam and to B. Skinner for his comments on these two species. — ADRIAN M. RILEY, Entomology and Nematology Dept., AFRC Institute of Arable Crops Research, Rothamsted Experimental Station, Harpenden, Hertfordshire AL5 2JQ.

MOTHMANSHIP (HOW TO BE ONE-UP AMONGST LEPIDOPTERISTS) PART I: NAMESMANSHIP

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RECENTLY, whilst re-reading the works of Stephen Potter, I realised, with some regret, that the great master of Lifemanship never turned his attention to our interests. It is in an attempt partially to fill this lacuna, that I offer some of the results of research and observation on this subject, beginning with the tricky problems of namesmanship.

Few entomologists, in the past forty or so years, will have studied Latin and the rest of us have largely forgotten what we knew. There are still those who are put off from joining a society or to subscribing or contributing to a journal such as this for fear of mispronouncing a Latin name, or failing to keep up with the taxonomists. This need not be so. The beginner is reminded that there is still no agreement amongst classicists, particularly in regard to the pronunciation of Latin names. Faced with a dilemma, let the beginner try the "w-plan". Suppose you are working ivy with an Old Master. . . .

Old Master: "What's that up there on your left?"
Lifesman (in a questioning voice): "*Waccinii*"

This will not only infuriate the Old Master, but cast doubts upon his vision. A similar ploy, when working in deep heather, could be: "I notice you are getting *waria*."

Whilst it is usual for Macro men to drop the genus in conversation (". . . isn't that another *alchymista* on the sheet? . . .), Micro men insist, perhaps with good reason, on the full scientific name and some, even in the field, add the authority! Can this be countered? Suppose you are rummaging in rotten wood with a Micro Man. . . .

Micro Man (apparently addressing an invisible insect): "Ah! *Nemapogon wolffiella* Karsholt & Nielsen."
Lifesman (plonkingly): "Is not that the little chap dear old Stan Wakely used to net hovering over the flies of sleeping tramps? I knew him well."

Those of us who have been collecting for over fifty years have seen many name changes and often, in an unguarded moment, slip back into a rejected synonym. Indeed, amongst ourselves, we may fall back on the English name to save confusion. Faced with the keen youngster who swots up his "Bradley & Fletcher" in bed at nights, one can only let the old eyes grow misty and murmur " . . . *sibilla* was a much more attractive name . . . ." Faced, however, with a professional taxonomist use a brisk, no-nonsense voice:

"You chaps still at it? Pity you couldn't get things right first time. Still, you must be making a packet out of all these new lists. Must have several chaps changing labels in the R.C.K. collection continuously. Daren't get it right or you would be redundant I suppose."

Varieties. Few would argue that the founder of this Journal, J.W.Tutt, was top entomologist of his time. He himself had no doubts on this. He was the greatest coiner of varietal names and his prime purpose in founding the *Record* was to publicise these names. This gave the run-of-the-mill collector a chance to add his name to the roll of Science. Officially, varietal names are not recognised by the International Commission on Zoological Nomenclature and this view is reflected by our own august institutions, such as the British Museum (Natural History).

The British Museum never tried to acquire Tutt's collection of types. They did not care for Tutt, nor he for them! He rejoiced in pointing out the Museum's misidentifications. In his introduction to volume IV of his *The British Noctuae and their varieties*, he was particularly scathing . . . a couple of quotations from that work will convey the flavour; on page x he writes ". . . A British collector will understand the seriousness of these errors, when I say that in a series of *Hadena* (*Mamestra*) *thalassina*, there are eight specimens of *thalassina* two of *H. adusta*, and four of *genistae* . . . ." After a number of other examples he concludes ". . . These errors, at any rate, will be sufficient to give workers of the NOCTUAE some idea of the comparative worthlessness of the British Museum material of this group in its present condition. . . ." I must hasten to add that Tutt's work was published in 1892, and there have been some changes in the BM collections since then!

Dr E.A. Cockayne, who edited the *Record* from 1951 to 1955, was a well respected entomologist who published many papers on the aberrations of British macrolepidoptera, and generated many new names. The British Museum was in a tricky situation — it could not show enthusiasm for varietal names, and yet the Rothschild-Cockayne-Kettlewell collection, which the museum owned was (and is) recognised as *the* collection of varieties and aberrations. In the end, the Museum produced its vast, secret book of varieties for internal use only and which had to include Tutts contribution, which must have pleased his Shade.

Bright and Leeds, in 1938, went one better when they worked out their system to cover all possible variations (*A monograph of the British Aberrations of the Chalk-hill Blue Butterfly*) thus depriving Butterfly men of their opportunities. However, an examination of the colour varieties of the blues in their collection is not in vain, if they are examined with rose coloured spectacles.

THE OCCURRENCE OF *EUCOSMA OBUMBRATANA* (LIENIG & ZELLER) (LEPIDOPTERA: TORTRICIDAE) CONFIRMED IN SCOTLAND

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Eucosma obumbratana (Lienig & Zeller, 1846) was stated in Bradley, Tremewan and Smith (1979) to be "apparently unknown in Scotland except for an old record from Renfrewshire (Paisley)". However there appears to be no further literature reference or specimen of this Paisley record. This article confirms the occurrence of *E. obumbratana* in Scotland.

On 1st August 1980 a specimen of *E. obumbratana* was taken on waste ground near Niddrie Mill on the outskirts of eastern Edinburgh (OS Grid Ref. NT 3071, V.C. 83). A second specimen was taken on 2nd August 1980. The site was a grassy bank of a former railway siding near the base of a disused mine tip. The specimens were taken in flight between 20:00-21:30 hours. There were a number of plants of *Sonchus arvensis* L. in the vicinity which Bradley, Tremewan and Smith (1979) state as being a host, the larvae living in flower heads and feeding on developing seeds in August and September. Some flower heads of *S. arvensis* at the site were examined in other years but no larvae of *E. obumbratana* were found.

The site has now unfortunately been destroyed. The old mine tip has been flattened and the surrounding waste ground bulldozed. It is to be hoped that the population has been able to survive on waste ground nearby where there are still some plants of *S. arvensis*. The specimen caught on 1st August 1980 was displayed at the Annual Exhibition of the British Entomological and Natural History Society at Chelsea on 24th October 1981 by Keith Bland. This specimen has been placed in the Royal Museums of Scotland, Edinburgh.

Two more recent records of *E. obumbratana* in Scotland (collected by Robin Knill-Jones) were listed in Agassiz (1987): from Glasgow Zoo in Vice County 77 (Lanarkshire) 28.vii.84 and from Kirkdale in Vice County 73 (Kirkcudbrightshire) 7.viii.84.

Robin Knill-Jones' records confirm that the species exists in the West of Scotland and with the 1980 Edingburgh records indicates that *E. obumbratana* is probably reasonably widespread in Southern Scotland and it is possible that intensive searching of the host plant and sweeping suitable habitats in late July and August would turn up further specimens and new localities.

Acknowledgements

The author wishes to thank Keith Bland for identifying the two specimens of *E. obumbratana*, the late Ted Pelham-Clinton for confirming the

determinations and Darren Hendry, Mark Tait and Anthony Duffy, local children, for helping to collect the specimens.

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Ennomos fuscantaria **Haw. (Lep.: Geometridae) — a Melanic Form in N.W. Kent**

Dr B. Kettlewell (*The Evolution of Melanism*, 1973) suggests that *E. fuscantaria* ab. *perfuscata* Rebel is a widespread recessive melanic, perhaps industrial, which he states has been recorded from Essex, Oxon and Yorks; the form is not mentioned by Chalmers-Hunt (*The Butterflies and Moths of Kent,* **3**: 1981), although he does refer to a "very dark" specimen taken at Pinden by E.J. Hare in 1963. The species has been a frequent visitor in its season to my garden m.v. light during the past twenty years, so it was with some surprise that I found a fine male melanic in attendance on September 4th 1988, and this was followed by another on September 7th. Both specimens are extremely dark, including the head, thorax and abdomen, which is in contrast with some melanic forms of other species of the genus, for in these only the wings exhibit the dark pigmentation.

Perhaps it is also worth recording that the twelve specimens of *fuscantaria* seen at the light in 1988 produced a further aberration, a male ab. *approximata* Lucas of which Chalmers-Hunt notes but one previous record for Kent, from neighbouring Bexley as long ago as 1912. — B.K. WEST, 36 Briar Road, Dartford, Kent.

Early emergence of *Thera britannica* Turner (Spruce Carpet) (Lep.: Geometridae)

A SINGLE male of this species was caught in the Rothamsted Insect Survey light trap at Ludlow, Shropshire (Site No. 488, O.S. grid ref. SO 514 743) on 6.ii.1989. This species usually overwinters in the larval stage, the adults flying in September and October and again in May and June. The present specimen is probably the result of a larva which completed its growth prematurely due to the very mild winter weather. It is less likely to be a survivor of the autumn brood as this would constitute a remarkable extension to the normal life expectancy of individuals of this species.

Thanks are extended to S.C. Littlewood who operates the trap at Ludlow. — ADRIAN M. RILEY, Dept. Entomology and Nematology, AFRC Inst. Arable Crops Research, Rothamsted Experimental Station, Harpenden, Hertfordshire AL5 2JQ.

THE OCCURRENCE AND DISTRIBUTION OF THE GENERA *ACMAEOPS* LEC. AND *JUDOLIA* MULS. (COL.: CERAMBYCIDAE) IN GREAT BRITAIN.

RAYMOND R. UHTHOFF-KAUFMANN

13 Old Road, Old Harlow, Essex CM17 0HB.

Introduction

THESE Three Cerambycids. of which two are very rare, share a common practice, exceptional among our life of Longhorn beetles, of pupating in the soil instead of undergoing their punultimate transformation in a cell of their respective host plants.

Symbols in use are the Balfour-Brownean alphabetic, those italicized indicating widely found species and bracketed letters standing for dubious or unconfirmed records. (Kaufmann, 1989)

Acmaeops collaris L.

This pretty little beetle was illustrated some 200 yers ago by Martyn. It is a very local woodland species which was formerly confined to the southern regions and the Midlands, but not beyond the Manchester area; there is increasingly restriced to the point distribution is becoming increasingly restricted to the point of vulnerability, and it is now regarded as an endangered species, rarely encountered except perhaps in a very few March counties of England. There are no recent records of its capture.

ENGLAND: CB (CH) EC EK EX GE HF LN LR SD SH SL (SP) SR *WK* WO
IRELAND: (RO).

The Cheshire entry in Fowler (1890) '. . . banks of the Bollin' has been traced to the collector, Revd. T. Blackburn, a Coleopterist of the 1860's, but *A. collaris* is not named in his lists of captures published in the entomological magazines of those times: the record is conceivably based upon an erroneous identification. The Irish one, claimed by the egregious R.E. Dillon (Johnson & Halbert, 1902; Fowler & Donishthorpe, 1913), is of very doubtful provenance (Speight, 1988).

The larva is principally associated with the decaying exposed roots and dead branches of oak trees; it has also been found in ash and aspen; and abroad in chestnut (Perris, 1877), but not so in England.

Most strangely for a Cerambycid, it does not make burrows in the wood itself, but lives in the empty galleries of other wood borers, feeding on the underside of the loose bark, and where Longhorns have been tunnelling, probably on their old fungus covered frass. The very active larva may be found crawling freely on either side of the dead bark, and rapidly over the ground in search of other roots and branches. Its unusual appearance, hairiness, long legs and pseudopod with which it grips the bark when raising the rest of its body are reminiscent of a Lepidopterous caterpillar. Despite its accessibility in the open to parasites, its liveliness and perhaps

appearance have evidently not encouraged them, for none is reported.

After nearly two years the autumnal pupation takes place in a very shallow underground cell close to the host tree's roots, where the beetle overwinters until the following April. The imago emerges in May and June. It was formerly common in the hopfields of Kent, in gardens and along flowering hedgerows, having been taken off apple blossom, cow parsley and other umbels, hawthorn, meadow sweet, spurge and *Viburnum* during the early summer until July.

Its presence in and on the chestnut poles used in the Kentish hop gardens is now questionable (Shirt, 1987), such damage in the former being more being likely attributable to *Clytus arietis* L. Duffy (1953) certainly never found *collaris* on any of the chestnut poles he examined.

Judolia sexmaculata L.

One of our three exclusively Scottish Cerambycids: the other two native species have been (and still are occasionally) exported southwards in logs and commercial wood, etc. Fortunately, *J. sexmaculata* is an increasingly scarce and rare beetle to which this is unlikely to happen; nevertheless, it is in need of some form of protection. The insect is almost without exception restricted to a few counties in the Highlands, and is perhaps a relict species of the ancient Caledonian (palaeozoic) coniferous forest fauna (*teste* Dr P.S. Hyman).

SCOTLAND: AS EI EL PM PN RW WT.

The larva attacks the stumps and roots of Norway spruce, Scots pine and firs, and probably those of larch. Metamorphosis lasts two years, pupation taking place in a shallow earthen cell near the host tree's roots. The perfect insect emerges in summer and is particularly attracted to flowers. It may be found during June and July (and more rarely in August) on hogweed (greatly favoured) and other *Umbelliferae*, raspberry, rowan blossom, scabious, *Spiraea* and *Viburnum*.

Because *sexmaculata* so likes flowerheads, one method of observing it is to place bunches of blossoms in a jamjar along woodland rides and edges in order to entice a visit from the adults.

This is a very variable beetle, with elytral patterns ranging from the typical yellow background with its black bands and maculations to increasingly dark forms verging on the melanic: none has been worked out in this country, but Villiers (1978) depicts no less than 33 varieties.

J. cerambyciformis Schrank

A beetle usually found on flowers in wooded areas and distributed in three main regions:— south-westerly and southern, from Cornwall to Middlesex; westerly, including a number of Welsh counties; and the north. Records are lacking from East Anglia, nor has it been found in Ireland.

ENGLAND: BK CH *CU* DM DY *EC* EX GE GW HF L LR MM MX *ND* NW *SD* SH SN *SR* SS ST SY WK WO *WX WY*.
WALES: BR CD CR DB GM MG MN RA.
SCOTLAND: AS BW EI HD LA WT.

The larva is found in the natural state in the exposed, recently dead roots of birch, chestnut, oak, silver fir and spruce, more especially those uprooted by storms. It prefers the damper underside of the roots and will work its way through shallow tunnels in the soil in search of a moister pabulum. Under controlled conditions Duffy (1953) raised larvae to maturity in a variety of dead material, including alder, beech, pear, poplar and Scots pine; they showed no particular preference for any of these, deciduous or coniferous roots and branches, provided they were sufficiently moist.

After two years the larva pupates in the ground quite a few inches deep, the mature beetle emerging in May or June. It is essentially a flower loving insect, occurring until September on *Angelica*, apple blossom, brambles, buckthorn, dogrose, hemlock, hogweed, holly, *Oenanthe*, ox-eye daisy, raspberry, *Spiraea*, sweet brier and *Viburnum*.

J. cerambyciformis has the curious habit of hovering up and down over the flowers it frequents before settling, rather in the manner of a Hymenopteron, and is often found sharing blossoms with *Strangalia* and *Leptura* species. It is not uncommon and very occasionally is locally abundant, if season and conditions are conducive. The elytral markings are extremely variable, ranging from albinotic to near melanic forms. At least a hundred have been described and figured (Milliat, 1966) of which 48 are drawn by Villiers (1978). So far, no attempt has been made to classify the many British varieties that must exist.

Neither of these two *Judolia* species has attracted the attention of any Hymenopterous parasites.

Acknowledgements

Cordial thanks for their information and help are extended to A.A. Allen, Esq., D.B. Atty, Esq., Miss I. Baldwin, Royal Museum of Scotland, J. Cooter, Esq., Dr P.S. Hyman, Mrs B. Leonard, Librarian, Royal Entomological Society and Professor J.A. Owen.

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Hazards of butterfly collecting — Andamans, 1988.

One of the nice things about collecting butterflies in the remoter part of the tropics is the "gung-ho" image that you build up in the eyes of relatives and friends. They fondly imagine you braving hordes of mosquitoes, sand-flies, botflies, jiggers, leeches, ticks, etc., pausing only to dispose of the passing tiger, cobra or gaboon viper, all in the interest of furthering our knowledge of butterflies.

Normally it is not like that, of course. The tropical rainforest is often a very pleasant place, and though a mosquito net is advisable if you sleep there I have rarely been chased away by insects. I have certainly been less frequently chased away from a forest camp than from bedbug infested inns in India. I am writing this on the Andaman Islands, strewn in the Indian Ocean between India and Burma. I have spent seven days collecting in dense forest with only a handful of insect bites to show for it, as well as about half the butterfly species recorded from the islands. But I was reminded that here and there a special hazard lurks . . . leeches.

I was warned that Mt. Harriet was leech infested and took the precaution of having a pair of leech socks manufactured in advanced. These are made from dense canvas to fit the foot inside the shoe and then to be tied tightly just below the knee. Leeches go through ordinary socks like a knife through butter. On entering the dense, wet forest on Mt. Harriet it was time for leech check number one: Stop and look down. Sure enough, serried ranks of leeches advanced from all corners. A couple of steps left, and the legion of leeches would turn with a precision that would make a regimental sergeant-major weep with pride.

The leech socks and the trousers have to be carefully monitored at regular intervals, so that any leeches crawling up can be flicked off. Without leech socks you would simply have to flee. Never kneel, never sit, especially not on your boots which are teeming with leeches, and you can get in a day's collection with little damage.

You cannot avoid being targeted altogether. Some leeches make their way up your trousers and/or shirt and start drinking your blood. Do not pull them off — their mouthparts will stick and itch, maybe even create a festering, septic wound. Any discovered sucking can be made to let go by the application of a lighted cigarette. Even non-smokers should carry same, as they say in India, in leech infested jungles. However, usually biting leeches will only be discovered when they drop off your stomach, breast or neck, or wherever they found an entry through the clothes. Leeches drop off when they have finished eating, and the anti-coagulants that they have injected ensures a copious flow of blood. Just five or six leeches that have had their fill can make you return with the shirt and parts of the pants drenched in blood.

I visited Mt. Harriet with Jason Weintraub, a super-energetic American postgraduate student of red-bodied swallowtails (*Pachliopta*), whose

favourite study objects share the ecological requirements of leeches. As we de-leeched that day back in Port Blair with the aid of lots of salt, we took more than 200 out of our shoes — because of the leech socks we had only six actual bites between us.

Many people react to leeches with an almost primeval horror, eloquently expressed by Katherine Hepburn and Humphrey Bogart in the film "African Queen". Even I, as a naturalist, cannot avoid a shudder that is less rational that I would like (and a pleasure in scorching a leech with a cigarette that is more intense than I would like).

From one to four days after the bite the little welts left by the leeches itch terribly, but it is still at this point that the rational naturalist returns. There is one good thing to say for leeches — quite possibly they will eventually provide the ultimate medicine to prevent blood clotting. If researchers have problems getting enough leeches the trail from Panighat up Mt. Harriet will oblige. — TORBEN B. LARSEN, 358 Coldharbour Lane, London SW9 8PL.

Cyclophora pendularia Cl. (Lep.: Geometridae) in Hampshire

INSPECTING the contents of my garden m.v. trap, which is situated in St Ives, near Ringwood, on the morning of 28th July 1988 I was surprised to discover, remarkably well camouflaged against the egg-box material in the trap, a pristine female *Cyclophora pendularia* Cl., the Dingy Mocha. Over the next few days, and with apparent reluctance, she laid 50 eggs on sallow, particularly favouring the cut edges of small leaves. She expired on 9th August, a tattered wreck, with all her eggs proving to be infertile.

Over the next few weeks an actinic trap was placed in a variety of sites amongst sallows in the surrounding heaths without success, although a variety of other interesting heathland species was seen including *Idaea sylvestraria* Hübn., *Selidosema brunnearia* Vill., *Gnophos obfuscata* D. & S. and *Heliothis maritima* Grasl.

Despite my failure to locate further examples, this species is probably resident on local, damp heaths as is the case near Ferndown where second brood examples have also been taken at light (Ray Cook, pers. comm. and *Ent. Rec.* **99**: 184); alternatively it may have been a wanderer from this locality, which is only three miles distant. — Dr. JULIAN CLARKE, 11 Sandy Lane, St Ives, Ringwood, Hants.

Double-Brooded *Eupithecia tripunctaria* Herrich-Shäffer (Lep.: Geometridae).

B.K. WEST's note in this journal (*antea* **101**: 57) should be read in conjunction with one written by Louis B. Prout some eighty years earlier, published *Entomologist* **40**: 221 (1907). Prout had no doubts but that *albipunctata*, as it was then called, was certainly double-brooded (no fancy

term like bivoltine in those days!). His note was to draw attention to the possibility that this pug — like *innotata/fraxinata* and *virgaureata* on which he had written at greater length — might alternate tree and flower feeding for summer and autumn feeding larvae respectively. But he had to recourse to German experience for an instance of an *albipunctata* larva found by Nickerl senior at Prague on elder in June that produced a moth on 8th July (presumably in the same year but Prout does not say). Prout then remarked how summer larvae of *albipunctata* would eat flowers, quoting D'Orville's account given in Barrett vol. 9 p. 79. Mr West might have quoted this, becaused it remains the only recorded instance of a second brood of *tripunctaria* bred in captivity — D'Orville paired moths in April from which larvae fed up rapidly on *Anthriscus sylvestris*, becoming full-grown within a fortnight and producing moths in July.

In 1988 I too reared larvae of *tripunctaria* on *Anthriscus* from eggs of May moths from *Angelica* larvae of the previous autumn, and they also fed up with no loss of time even if in rather longer than a fortnight. But the pupae still lay over to produce moths in the following spring.

I was with Bernard Skinner in July 1978 when *tripunctaria* larvae were beaten from elder flowers in Lincolnshire. I went on working elder over a variety of situations in central Lincolnshire and found the larvae in plenty on bushes in low-lying sites and on rising ground towards the Wolds, but not actually on those hills. I was interested then to speculate on the autumnal alternate foodplant on the drier upland sites, and I rashly assumed this species emulated *trisignaria* in taking to hogweed. All these elder flower July feeders produced moths in the following Spring. Since 1978 I have beaten elder flowers in July in Norfolk, sometimes on sites where adjacent *Angelica* has yielded *tripunctaria* in quantity in autumn, but I have never again found elder flowers produce this species.

We therefore await to hear from the first successful enterprising pug enthusiast to sweep *tripunctaria* larvae from *Anthriscus* in early summer. Even more commendable would be the discovery of larvae at that time of year on foliage of perhaps hawthorn or even maybe elder. — G.M. HAGGETT, Meadows End, Northacre, Caston, Attleborough, Norfolk NR17 1DG.

Evidence for bivoltinism in *Eupithecia tripunctaria* Herrich-Schäffer (Lep.: Geometridae) in north-west Essex.

IN HIS recent paper (*antea*, pp. 57-59), B.K. West states that he has no source for the dates of occurrence of this species in Essex. Trap records made at Saffron Walden from 1985 to 1988 give the following consolidated data:—

25 May-19 June, *c.* 25 specimens; 20 June-8 August, nil; 9 August-28 August, *c.* 30 specimens.

Larvae are common in local woodland rides but the adult comes to my light in the town only on nights of high entomological activity. — A.M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex CB11 3AF.

Second International Congress of Dipterology

WE HAVE received advance notice of this important event which is to be held in Bratislava, Czechoslovakia from 27th August to 1st September 1990. The official language will be English, and an ambitious programme is proposed. Field trips, tourist and social events are also planned as well as an intriguing "special programme for ladies".

The first Congress, held in 1986 in Budapest, attracted over 300 delegates, and was judged a success. Interest should be registered as soon as possible with Dr Ladislav Jedlicka, Department of Zoology, Comenius University, Mlynska dolina, CS-842 15 Bratislava, Czechoslovakia.

Coleophora lassella **Stdgr. (Lep.: Coleophoridae) and other microlepidoptera at a Rothamsted trap in Surrey**

DURING the 1987 and 1988 seasons I have been identifying microlepidoptera caught in the Rothamsted trap operated by Andrew Halstead at the Royal Horticultural Society's Garden at Wisley, Surrey. Of the 235 species of micros identified to date several are worthy of note including:

Caloptilia populetorum Zell., *Acrocercops brongniardella* F., *Rhyacionia pinicolana* Doubl., *Agriphila latistria* Haw., *Sitochroa verticalis* L. and *Acrobasis tumidana* D. & S.

Most interesting however was the occurrence of a single *Coleophora lassella* Stdgr. in the catch for the week 14th-21st August 1988. The specimen, a male, was identified from the genitalia and the identity confirmed by Dr John Langmaid, who informs me that the species is little known in Britain and hitherto unrecorded from Surrey. — R.M. PALMER, 2 Glenhome Gardens, Dyce, Aberdeen AB2 0FG.

An early record of *Agrotis segetum* D. & S. (Lep.: Noctuidae)

ON 22nd March 1989 one *Agrotis segetum* was attracted to light in my garden together with seven more seasonal macrolepidoptera. This seems a very early date for this species. — R.J. HECKFORD, 67 Newnham Road, Plympton, Plymouth, Devon PL7 4AW.

A further note on the Orange-tip butterfly (*Anthocharis cardamines* L.) (Lep.: Pieridae)

I WAS most interested in Adrian Riley's note (*Ent.Rec.* **101**: 18), where he recorded eight Orange-tip eggs on a single plant of garlic mustard. During spring of 1987 I found six eggs on a single plant of dame's violet (*Hesperia matronalis*) and five on another. As both plants were in my garden, there was plenty of opportunity to observe these "cannibals" in action.

All the eggs hatched, and all the larvae survived. They kept their distance from one another, first feeding on the flowers and then on the seed capsules. The plants were large enough to sustain all the larvae, and smaller plants were apparently not selected for egg-laying. Also of interest, in 1988 I found a few Orange-tip larvae on garden arabis (a pink flowered variety). The plants were vigorous, growing between other low plants, and over garden wire to a height of some 14 inches. Perhaps this presentation made the arabis more attractive to egg-laying females? — JAN KORYSZKO, 3 Dudley Place, Meir, Stoke-on-Trent, Staffordshire.

Hadena compta D. & S. in north Worcestershire

IN A recent note (*Ent.Rec.* **101**: 84) I was recording moths new to my garden in Blackwell, north Worcestershire. Editorial changes made to the note unfortunately gave the impression that I was claiming the capture of a specimen of *Hadena compta* as a new county record, rather than as a new addition to my garden list.

Hadena compta is a recent arrival in Worcestershire, having first been captured in 1987 (Simpson, A.N.B. (1988) *Ent.Rec.* **100**: 189). — M.D. BRYAN, Keeper of Natural History, Birmingham Museum.

NOTE: Our apologies to Mr Bryan for this slip, and for any embarrassment it may have caused. Editor.

Agrotis ipsilon Hufn. (Lep.: Noctuidae) in March

ON 11th March 1989 a single specimen of the Dark Sword-grass *Agrotis ipsilon*, came to my m.v. light in the garden. Unless evidence is forthcoming of a more general immigration at this time, it may be that the specimen had survived the mild winter. — J. OWEN, Eastbridge House, Dymchurch, Kent TN29 0HZ.

Tachinus flavolimbatus Pand. (Col.: Staphylinidae) in Norfolk

UNTIL reading the note by Mr A.A. Allen (1988, *Ent.Rec.* **100**: 234),I had not realised that *T. flavolimbatus* was still so restricted in distribution, at least according to published records. An easily missed note by H.R. Last (1963, *Proc.S.Lond.ent.nat.Hist.Soc.*, 1962: 1-2) adds a few more localities to those given by Mr Allen. Last looked at 320 specimens of the very similar *T. marginellus* (F.) in the collections of Side, Steel, Tottenham and Joy, as well as his own; he found 15 examples of *flavolimbatus*, including ones from Jersey, Wood Walton, Hunts and Wells. The single specimen collected by Joy from the latter locality was almost certainly from Norfolk (as opposed to Somerset) and possibly was taken during his visit in 1904, when he found *Corticarina truncatella* (Mann.) new to the British list (1908, *Ent.Rec.* **20**: 91).

I can add a further, more recent, Norfolk record. On 11th October 1987 a single specimen of *T. flavolimbatus* was collected from a large mound of

rotting carrots and potatoes in a roadside dump near Snetterton, West Norfolk. I have no reason to suspect that the vegetables were of other than local origin. The apical segments of the hind body were use to identify the specimen, by comparison with those figured by W.O. Steel (1961, *Entomologist* **94**: 77-8). The date of capture adds further evidence to Mr Allen's suggestion that this is a winter species. — M. COLLIER, 67 Church Lane, Homersfield, Harleston, Norfolk IP20 0EU.

Stored grain pests and their control by **G.A. Zakladnoi** and **V.F. Ratonova.** 268 pp. 97 figs. Boards. A.A. Balkema/Rotterdam, 1987. £22.50.

Although published in 1987, this volume turns out to be a translation from the original Russian of a volume published in 1973. Written as part of the initiative resulting from the Directives of the XXIV Congress of the Communist Party of the Soviet Union on the Five-year Plan for National Economic Development (relating to projections of gross grain yield), this book sets out to present a detailed account of stored-grain pests and infestation of grain and grain products by these pests. It details methods for detecting visible and occult infestations of grain stores and grain-milling plants, dealing also with physico-chemical, mechanical and chemical methods for the control of pests.

Although there are no diagnostic keys, there is a reasonably comprehensive account of the various pest species, covering mites, Thysanura, Orthoptera, Psocoptera, Coleoptera, Lepidoptera, birds and rodents. Each species is described with detailed notes on biology and line drawings of adults and larvae as appropriate. Because of the date of the original publication, much of the material on control measures, decontamination techniques, chemical detection of pesticide residues and safety measures is of historical interest only. NMD.

Provisional Atlas of the Sepsidae (Diptera) of the British Isles by **Adrian Pont.** 33 pp. 28 maps. Limp. Institute of Terrestial Ecology, 1986. £3.00.

The larvae of this interesting group of flies are usually associated with habitats such as the dung of various species, carrion, decaying fungi, rotting vegetation etc. The study of this small group was greatly facilitated in 1979 by the publication of volume ten, part five (c) of *Handbooks for the Identification of British Insects: Sepsidae*. Diptera Cyclorrhapha, Acalyptera (by the author of this *Atlas*). After a brief introduction, the distribution of each species is mapped on a 10km grid. Each map is accompanied by a brief narrative giving notes on abundance, habitats for adult and larva, and world distribution. As with all the *Atlas* series this makes a significant contribution to our understanding of the distribution of these insects.

Contents — *continued*

TO OUR CONTRIBUTORS

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

(Founded by J.W. TUTT on 15th April 1890)

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Notes and observations

continued

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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PHYLLONORYCTER LEUCOGRAPHELLA (ZELLER, 1850) (LEP., GRACILLARIIDAE) IN ESSEX: A SPECIES NEW TO BRITAIN

by A.M. EMMET

Labrey Cottage, Victoria Gardens, Saffron Walden, Essex CB11 3AF

MRS F.A. SARGENT, a keen gardener who lives at Wickford, Essex, has *Pyracantha* bushes of three varieties trained against her garden fences. In February of this year she noticed unsightly blanching of many of the leaves, so she asked her daughter, Mrs J. Dietz, a member of the Royal Horticultural Society, to write to the Society at their Wisley Gardens, enclosing some of the leaves, to ascertain the cause. The leaves were passed to their entomologist, Andrew Halstead, who recognised that the damage was being done by a lepidopterous leaf-mining larva, but was unable to identify the species from the British literature. Accordingly he sent me the leaves for my opinion. Reference to Hering (1957) showed beyond doubt that it was *Phyllonorycter leucographella* (Zeller), a southern European moth not previously recorded in Britain.

I visited Mrs Sargent on the 10th March and found the infestation so extensive that she had indeed good cause for alarm. She gave me permission to make further visits, so I returned on the 18th, accompanied by Dr J.R. Langmaid and the Rev. D.J.L. Agassiz. None of us had ever seen such a high incidence of *Phyllonorycter* mines before, though we remembered comparable damage to Breckland larch trees from the case-bearing larvae of *Coleophora laricella* (Hübner) in the spring of 1987. We helped ourselves, perhaps less liberally than Mrs Sargent would have liked, and then started to look elsewhere. On this and on subsequent occasions when we operated independently, C.W. Plant then also taking part in the search, we found mines on the majority of *Pyracantha* examined from East Ham in Greater London to Benfleet, near Southend, the south-eastern limit of our quest. On many of the bushes they were present in profusion, but diminished markedly northwards, the most northerly site being at Kelvedon (TL 8610). The known Essex distribution is shown in figure 1. Almost the whole of one expedition was devoted to a search of the area further north with negative results; Brian Goodey examined over 70 bushes in the Colchester area without finding a single mine. Colin Plant has looked in the west of the county and David Agassiz and I separately in the west end of London, all without success. David Agassiz visited west Kent, but found it only on a single bush just south of the Woolwich Ferry; other searchers have drawn blank in that county. The map, therefore, gives a fairly accurate picture of the moth's present range in Britain and may be used to assess the rate of any further advance.

It is difficult to estimate how long the species has been present in Britain;

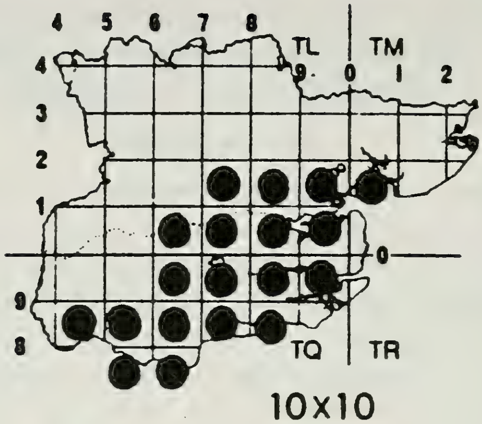

Figure 1. The distribution of *Phyllonorycter leucographella* (Zeller) in Essex — May, 1989.

it must have taken several years for it to build up to its present degree of abundance. There are contradictions over its earlier status in France, the most likely source for the Essex population. *P. leucographella* is included by Le Marchand (1936) in his paper on the French species of *Phyllonorycter*, but with inaccuracies which suggest that it was unfamiliar to him. Leraut (1980) omitted it from his French check list, but later (Leraut, 1984), in introducing it as a species new to France, he stated that he had been aware of its mines in the neighbourhood of Paris for the past ten years. In 1988 M. Gibeaux sent tenanted mines from the Paris region to David Agassiz, presumably because it was a species attracting current attention. The extension of its range in Europe is being studied by Dr J. Buszuko of the Copernicus University, Poland, together with that of two other *Phyllonorycter* species, *P. platani* (Staudinger) and *P. medicaginella* (Gerasimov) which feed on the host-plants whose names they bear (J. Buszuko, pers. comm.). Neither of these two has yet been recorded in Britain, but the former, especially, may well reach our shores. *P. leucographella* could easily have escaped notice in Essex for several seasons, since there are few microlepidopterists in the county and *Pyracantha* is not a plant normally searched for leaf-mines, least of all in late winter.

We have recently experienced mild winters and the question arises whether this winter-feeding Mediterranean species could survive severe cold. It probably can do so. *P. messaniella* (Zeller) is a southern European species (type locality Messina in Sicily) and has a very similar life history. The larva mines the leaves of holm-oak (*Quercus ilex*) from December to March and it is one of our commoner species. *Stigmella suberivora* (Stainton) (type locality Cannes in the Riviera) mines the same foodplant at the same season; it is a relative new-comer, having reached Britain in the 1920s, and it has not only survived but is still extending its range.

It would have been reasonable to suppose that the unwelcome local over-abundance of *P. leucographella* was due to a temporary immunity from parasites often enjoyed by new arrivals. This is not the case. Both moths and parasites began to emerge on the 1st April and the latter outnumbered the former on average by three to one, while at one locality the incidence of the parasites was 90%. The parasites, all of one species, were submitted to Dr M.R. Shaw who identified them as *Apanteles (sensu lato) circumscriptus* (Nees) (Braconidae), a common insect attacking various species of *Phyllonorycter,* other Gracillariidae and Elachistidae, in particular those that mine in winter like *P. messaniella* and *P. junoniella* (Zeller), or in early spring like *P. trifasciella* (Haworth).

A detailed description and account of the life history follows.

Phyllonorycter leucographella (Zeller)
Lithocolletis leucographella Zeller, 1850, *Stettin. ent. Ztg* **11**: 207.
Type locality: Italy; —Montenero, Tuscany.

Description of imago

Wingspan 7-8mm. Head with vertical tuft white mixed golden brown, frons white; antenna whitish, obscurely ringed fuscous, rather more strongly in female.Thorax bright golden brown, edged white and with a fine central white line; foreleg white, streaked and spotted fuscous, mid-and hind-legs white, hindtarsi unspotted. Forewing bright golden red-brown, in colour rather darker than *P. cerasicolella* (Herrich-Schäffer) and paler than *P. corylifoliella* (Hübner); Zeller compared it with his f. *betulae* of the latter species which he regarded as distinct and which has a better-defined white pattern than the typical form. He described the colour of *P. leucographella* as *croceus* in Latin and "safrangelbe" in German; Bradley *et.al.* (1969), based on Le Marchand (1936), give "bright yellow ochre". None of these descriptions is satisfactory because the ground colour is not a shade of yellow. Pattern clear white and sharply defined; four costal and two dorsal strigulae, variably black-edged inwardly, the second dorsal the most strongly; first costal short, oblique; first dorsal long, slender, curved and strongly oblique, sometimes broken into two, or even three, spots; basal streak, which forms a conspicuous extension to the white edging of the thorax when the moth is at rest, extending to one-half, sinuous, very slender but sometimes slightly thickened towards its apex, the statement by Le Marchand and Bradley *et. al.* that it is black-edged above being in contradiction to Zeller's original description and inapplicable to British specimens so far examined; base of dorsum finely white-edged; apical streak strong, diffuse, black, sometimes mixed white, often merging with the black edging of both dorsal strigulae, a form described as a variety by Zeller; fringe line from costal 4 to tornus black with lilac sheen; cilia golden

brown. Hindwing dark grey; cilia brown with golden sheen. Abdomen pale fuscous in male, pale golden brown in female, ventral surface of both sexes white.

Life history

Ovum. Laid on the midrib of the upperside of a leaf of the foodplant, in less populous colonies the lower leaves being preferred. In Britain, only *Pyracantha* has been recorded and that too is the only foodplant cited by Hering (*op. cit.*), but Bradley *et. al.,* following Le Marchand, add *Colycotoma spinosa* and *Cotoneaster pyracantha.* Zeller failed to identify the foodplant, describing it as a bush resembling privet but with long thorns. In consequence Stainton (1857), although he included *leucographella* in his key, omitted it from the list arranged by foodplants.

Larva. Head pale brown with darker mottling; body amber yellow; prothoracic plate pale brown with median sulcus. In early instars, a dark oval "saddle" on each segment. January to March.

Mine. Upperside; given correctly by Hering but, as also in the case of *P. corylifoliella,* stated wrongly to be on the underside by Le Marchand and Bradley *et. al.* At first a short reddish gallery along the midrib, but soon extending into the epidermis on either side, causing a silvery, red-flecked blister which eventually covers the whole surface of a small leaf; on large-leaved *Pyracantha* spp., and where numbers are high, there may occasionally be two mines in one leaf. In the tissue-feeding phase, extensive spinning causes the upper epidermis to contract and the leaf to fold upwards, ultimately forming a pod which almost conceals the mine. Feeding seems to be restricted to the palisade parenchyma, since there are no pale or discoloured patches in the lower epidermis. The black frass is scattered haphazard in the mine. The mined leaves are among the earliest to fall with the coming of the new spring foliage and from April onwards may be collected from the ground under the foodplant; where there is a heavy infestation the bushes lose their unsightly disfiguration with this leaf-fall. The mine is very similar to that of *P. corylifoliella* which could occur on the same foodplant but it lacks the inner mine of that species (see Watkinson, 1985, where I contributed the relevant passage). The larva of *P. corylifoliella* feeds in July and again in September-October, so there is no overlap of season.

Pupa. Pale brown; setae long; dorsal spines evenly distributed, small and diminishing in size towards the posterior margin of each segment; cremaster with two pairs of hooked processes, the inner pair widely separated and hooked inwards, the outer pair placed laterally and hooked outwards/forwards.Formed without a cocoon in a silk-lined chamber clear of frass at the end of the mine nearer the petiole. Prior to emergence, which

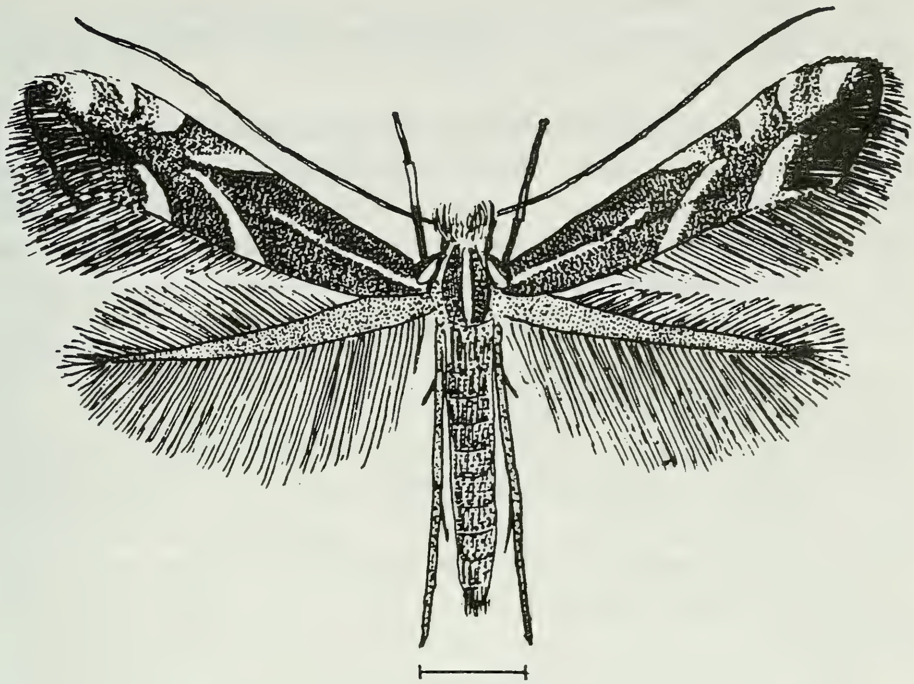

Figure 2. *Phyllonorycter leucographella* (Zeller) (Scale bar = 1mm).

takes place in the early morning, the pupa is protruded through the upper epidermis. March - May.

Imago. According to all authors, univoltine, appearing in April and May. In captivity emergence began on the 1st April and continued until the fourth week in May. Hering (*op. cit.*) speculates on the possibility of a second generation.

Distribution (see map). Essentially a suburban species, since the foodplant is not native but is frequently planted in private gardens, parks and along roadside verges. At present southern Essex, just extending into the extreme north of Kent, but likely to become more widespread. A native of southern Europe now dramatically increasing its range following the extensive planting of its foodplant for amenity purposes.

Position in the British list. P. leucographella belongs to the Rosaceae-feeding group, Log Book (Bradley & Fletcher, 1979) nos. 323 - 332, in which 328 *P. junoniella* and 331 *P. lantanella* (Schrank) appear to be intruders. I suggest placing it as 332a after *P. corylifoliella* because of the similarity in life history and since in the original description it was treated as most nearly akin to f. *betulae* of that species.

Entry in dichotomous keys

(1) MBGBI, vol. 2. On p.300 in righthand margin for 45 read 44a and add couplet:—

44a (43) Forewing with only two dorsal strigulae; basal streak very slender, no wider than antenna, but usually slightly thickened distally .... *leucographella*

Forewing with three dorsal strigulae; basal streak much broader than antenna, usually tapering distally 45

(2). Meyrick, 1928, p.769. Read as follows:—

19 Forewings reddish ochreous 19a
Forewings not reddish ochreous 20

19a Pattern obscure; one, sometimes two, costal strigulae . . *corylifoliella*
Pattern sharply defined; four costal strigulae .... *leucographella*

(3). Bradley *et. al.* (1969).
Assume wrongly that the basal streak is dark-edged and *P. leucographella* keys out correctly.

Acknowledgement

I am grateful to the Rev. D.J.L. Agassiz for the drawing of the adult reproduced at Figure 2.

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CYNTHIA CARDUI L. (LEP.: NYMPHALIDAE) IN THE IBERIAN PENINSULAR — SPRING 1988

Dr T.W.C. Tolman

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FROM 7th April to 20th May, my wife and I spent our time in Spain and Portugal. Our suspicion that, during this period, we were witness to an extraordinary migration of *Cynthia cardui*, is confirmed by related observations already collated in this Journal and elsewhere (refs.). It is with the desire of adding to our knowledge of this phenomenon that the following account is submitted.

Our journey from the Pyrenees to Portugal was attended by cold and sometimes rainy conditions. This afforded little opportunity for butterfly observation and matters did not improve until we reached the Algarve on 9th April. Even here, some 15km inland at an altitude of 150m, temperatures did not exceed 16°C between 9th and 12th April. Our first contact with *cardui*, on 14th April, occurred some 700m inland and slightly to the west of Lagos. The site was a small abandoned field containing many compositae which were exploited by three, fairly fresh, individually distinguishable insects. These remained in our company throughout the day which was cloudless and had a maximum temperature of 27°C. Our return to this location the following day at 11.00 hrs was greeted by scores of *cardui*. Most specimens examined were unchipped but very worn — field entomologists will know exactly what I mean in describing their wings as thin and greyish. The condition of the butterflies and the circumstances of the encounter, suggested that this gathering was the result of a migration from north Africa during the hours preceeding our visit.

Between 15th and 17th April, we recorded *cardui* as common and mostly fresh in all our collecting sites *en route* to the Spanish frontier at Ayamonte: indeed, having crossed the political boundary, our daily records for southern Spain up to 21st April, are very similar to those of Portugal. These relate to the area encompassed by the towns of Antequera and Malaga in the west, Granada in the north, and Almeria and Gergal in the east: corresponding altitudes of observation range from sea-level to 1700m in the Sierra Nevada. One additional observation may be of particular relevance. Between 18th and 20th April, the hot drive along the coast from Malaga to Almeria necessitated frequent tea-breaks. In consequence of augmenting all such refreshment with a paddle in the sea, I am able to report that the entire coastline appeared to be littered with the disintegrating remains of *cardui*. Mostly, only the wings of these presumed failed-migrants were in evidence, either floating in the sea or cast upon the sand.

The 22nd to 24th April was spent near Camporeal, south of Madrid Here too, *cardui* was much in evidence: my log entry for the 23rd reads;

"Swarming like midges over thistles in olive grove!" There were such large numbers that one's eyes were at slight risk from walking through the clouds of butterflies disturbed from their late afternoon feeding. All were fresh and many females could be seen ovipositing.

Having been all but trapped in heavy overnight snow at 1600m in the Montes Universales, Teruel, on 25th April, the next day was spent driving — in torrential rain — to the Sierra de Espuna in Murcia. In these mountains at 1200m on the 28th, my wife noted a steady, northerly movement of *cardui* which appeared to be using a military road as a flight-path. The following day, at 1400m, in sheltered area of about 100m by 200m, I came across an astonishing aggregation of fresh *cardui* imbibing on a dense growth of thyme. From an estimate of the density of these plants and the average number of butterflies per plant, I would consider 10,000 insects to be a conservative assessment of the size of this gathering.

We returned to the Montes Universales on 3rd May and continued to record *cardui* as common. However, it was not until 7th, on the same 1600m plateau from which we had effected a hasty departure on 26th April, that we witnessed further migratory behaviour. The day had been unsettled with showers and a maximum temperature of 12°C. Only an occasional *cardui* was seen up to 17.00 hrs, when, quite suddenly, a large concentration of northward flying insects appeared. In an effort to estimate numbers, I positioned myself a measured 25m from the margin of a small pine wood aligned in a north/south direction, and, facing south, proceeded to count the insects passing between myself and the wood. Very conveniently for this purpose, the flight-lines were generally straight and ranged from about 1m to 3m above the ground: indeed, departure from this striking linearity of motion occurred only for males spiralling in courtship display or for brief feeding stops. Mostly, the butterflies were in groups of four to ten — a further convenience, as it greatly facilitated the task of counting. This process proved demanding enough as it was, but several counts confirmed that 90 to 120 insects per minute were in transit during the period of observation, about 30 minutes. Wider investigation revealed the entire plateau to be affected to the same degree by this extraordinary phenomenon. According to estimates, made along a 2km section of the plateau road, of the order of 500,000 insects per hour were traversing this region and the migration continued, unabated, at the time of our departure, 18.30hrs. The early sunshine of the following day was soon displaced by heavy cloud and rain which held the maximum temperature to 11°C. The frequent showers persisted until 18.00hrs but did little to discourage *cardui* which took full advantage of the brighter interludes: indeed, whilst most butterflies sought refuge on the trunks of the pine trees during the heavier rain, others pursued their northerly objective quite undeterred. The following day, 9th May and our last on the plateau, was virtually a carbon-copy of the 8th. It did, however, include some hail which

ensured that temperatures did not rise above 10°C. The migration continued and a large concentration of insects appeared about noon, just before the onset of the heaviest rain we had experienced in this area. Thereafter, we made our way north and for the period of a somewhat meandering journey to Belgium, which we reached on 15th May, recorded no further significant observations.

Notwithstanding the considerable separation of the Iberian Peninsular from Arctic Scandinavia, it is convenient to include in this communication the record of the capture of a female *cardui* on 16th July near the town of Jokkmokk, some 2km north of the Arctic Circle. The specimen was flying, during a light shower, around thistles growing on spoil heaps. In recognition of the value of negative observation, it is perhaps worth mentioning that no other examples of this species were noted by us or the two Belgian friends who accompanied us whilst north of the Arctic Circle for the period, 29th May - 16th July.

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Late specimens of *Euchoeca nebulata* Scop. (Lep.: Geometridae) and *Cynaeda dentalis* D. & S. (Lep.: Pyralidae)

I READ with interest Colin Plant's note (*Ent.Rec.***101**: 16) concerning specimens of *E. nebulata* recorded in late August and September 1988. During August 1988 I ran traps at the Woolhampton reed beds, Woolhampton, Berkshire and recorded four specimens of *E. nebulata*, two each on the 17th and 23rd August. All specimens were in good condition. I did not visit this particular site in late May or June but, given the generally reasonable weather conditions earlier in 1988, it seems likely that the species was on the wing at the normal time. This being so then the August/September specimens could well represent a partial second brood over an area at least as extensive as Suffolk, Hertfordshire and Berkshire.

At *Ent.Rec.* **101**: 36 E.G. Smith records late examples of *C. dentalis* at Portland, Dorset. I have two specimens from Dungeness, Kent, dated 15th August 1987. Possibly this species has a somewhat longer emergence period than suggested in the literature.It is difficult to believe that a July species

would, in the dreadful weather conditions of July 1988, have felt obliged to produce an unexpected second brood.— DAVID YOUNG, 32 Valley Road, Burghfield Common, Reading, Berks.

Axylia putris L. (Lep.: Noctuidae) a melanic form in N.W. Kent.

ALTHOUGH Kettlewell (*The Evolution of Melanism*, 1973) omits this species from his list of those known to possess melanic forms, the National Collection contains a solitary melanic specimen which was taken by B. Goater at Mill Hill, Middlesex, 7.vii.1958, which he described as ab. *brunnea (Ent.Rec.* **81**: 27), and he noted the capture of another at Bushey, Herts 1.vii.1968. On 11th June 1988, I obtained a specimen of this form at my garden m.v. light at Dartford, presumably the first to be noted in Kent. In many parts of Britain *putris* is a very common moth, to be found at light, flowers, honeydew and sugar; it is interesting that the first melanic specimen was not noted until as late as 1958. Do these three individuals remain the only ones to have been encountered? — B.K. WEST, 36 Briar Road, Dartford, Kent.

Spring specimens of *Eudonia angustea* Curtis (Lep.: Pyralidae)

ON 8th February 1989 I noticed a small moth at one of the external lights of Blandford Upper School, which proved to be *Eudonia angustea*. Further specimens were noted on 13th March, 28th March and 1st April.

Goater (1986, *British Pyralid Moths*) gives July to October as the flight period of this species, but the second edition of Emmet (1988, *A field guide to the smaller British Lepidoptera*) gives September to May. Clearly it does appear in spring, presumably having overwintered, but there do not seem to be many published records of the spring occurrence. — R. DARLOW, "Iona", Fairfield Road, Blandford, Dorset DT11 7BZ.

Endotricha consobinalis Zell. in Britain: a possible immigrant?

Mr. B. Goody in his important account of the first known British example in his house at Colchester, Essex on 24th December, 1987 suggests that it presumably arrived as a pupa, possibly with celery from Israel which was then being handled there (*Entomologist's Record* **101**: 107-108).

It may, however, be relevant that this date was in the middle of the hitherto almost unique December influx of the butterfly *Cynthia cardui* L. Of this some 40 sightings have been reported all along the south coast from Cornwall to Sussex. Of these a dozen were on 23rd and 25th December and four others since 18th December. So there is a real possibility that the *E. consobrinalis*, battered when caught could have arrived with some of these. It is easily distinguishable at sight from its congener *E. flammealis*, and a look-out should be kept in future. — R.F. BRETHERTON, Folly Hill, Birtley Green, Bramley, Guildford, Surrey GU5 0LE.

AN APPARENTLY NEW SPECIES OF *HOMONEURA* (DIPT.: LAUXANIIDAE) FROM NORTH-WEST KENT

A.A. ALLEN

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ON 22nd July, 1975, I captured a pair of a Lauxaniid fly *in cop.* on a poplar trunk at Abbey Wood on the fringe of S.E. London in the north of W. Kent, which I failed to name with the aid of Collin's key (1948; 235). They proved to belong to the genus *Homoneura* v.d. Wulp, but clearly could not be referred to any member of that genus known from Britain, though superficially having the aspect of rather large *consobrina* Zett. because of the unspotted wings. The species was unknown also to my friend Mr E.A. Fonseca. It was only much later that a serious attempt was made to identify it, and the flies were submitted to Mr B.H. Cogan (then of the British Museum (Natural History)). He was able to confirm my conclusion that they could not belong to a known British species, and kindly checked them against those west and mid-European ones which might bear on the question. The Abbey Wood one cannot, moreover, be made to fit any of the additional Palaearctic species (none of them from W. or W.-mid Europe) described by Papp (1978), nor any other at present known to us.

Even though it may eventually prove identical with some described species, the most practical course meanwhile will be to bestow upon it an at least provisional name. This is especially desirable since further searches showed it to be well established in the locality — now alas, largely destroyed — and it must surely be present in others besides.

The species of *Homoneura* being of uniform general structure, it is expedient to describe this one by comparison and contrast with its nearest relatives in Britain.

Homoneura hospes sp.n.

A yellow, orange-yellow or (mostly in dried examples) brownish-yellow species,easily recognised among those recorded as British by its particular combination of characters. It differs from all five in having *four pairs of dorsocentral bristles* instead of the usual three, including *one presutural pair* (this sometimes reduced in size to about half that of the next, but still very obviously larger than any of the small bristles around it, and normally well developed).

Wings clear without any trace of cloud-spots on veins, but outer crossvein constantly rather darker than most of the long veins (readily appreciable on comparison with *consobrina* Zett., our other species with wholly unspotted wings, with the unaided eye or a low-power lens).

In most other characters resembling *tesquae* Beck., probably its nearest

ally among our species; notably in its almost subplumose arista, general chaetotaxy, and the fact that the two inner rows of acrostichal bristles are stronger and more raised than the others; but apart from the unclouded crossveins, differs in having antennal segment 3 alike in the sexes (short oblong-ovate), whereas in the male of *tesquae* it is slightly more elongate and slightly to very distinctly concave on its upper edge. Male genitalia and associated structures broadly similar to those of *tesquae*; lateral projections of the last two sternites in male as described by Collin (p.236) for that species — anterior pair set with very short black spines, posterior pair smooth; median ventral structures appearing simpler than in *tesquae*. Size between the last-named and *consobrina*, varying but little.

Abbey Wood, N.W. Kent, between 1975 and 1978 (see below); no other locality yet known. Holotype male at present in the author's collection, 15.vii.77. Paratypes in coll. BMNH, P.J. Chandler, E.A. Fonseca and the author; 7.vii.77, 15.vii.77, 27.vii.78. On poplar and willow trees.

To accommodate the new species, Collin's key requires to be modified in its first half (e.g. as follows) and the whole re-numbered:—

1(4). Wings quite without cloud-spots on crossveins or elsewhere.

2(3). Three pairs of dorsocentral bristles, all postsutural, but front ones very close to thoracic suture; the two inner rows of acrostichals like the rest; a bilobed blackish patch on occiput above neck, arista short-haired; outer crossvein no darker than the other veins .... *consobrina* Zett.

3(2). Four pairs of dorsocentral bristles, the front one presutural (occasionally small); the two inner rows of acrostichals better developed than the others; no such dark patch on occiput, only some very short black setules in its place; arista almost subplumose (as *tesquae*); outer crossvein always distinctly darkened, but not clouded .... *hospes* sp.n.

4(1). Wings with cloud-spots on crossveins, or faintly at ends of radial and cubital veins (*limnea*), or extensively spotted (*notata*) .... the remaining species, see Collin p.235.

The important character of the DC bristles can be expressed very concisely by means of the conventional numerical formula, according to which our species of *Homoneura* may be classed as follows: *hospes* 1 + 3, *limnea* 1 + 2, all the rest 0 + 3.

Searches for further material were made as soon as the interest of the find was realised; they met with considerable success. Specimens were obtained in part by sweeping crack-willows (*Salix fragilis*) and nearby Lombardy poplars (*Populus italica*) in a small area, and in part from the foliage of one or two bushy growths of "black" poplar (*P.x canadensis*) not far off at the edge of a car park. This second spot was close to where the original pair had been found. (With them occurred *H. consobrina* Zett., *Sapromyza obsoleta* Fall., etc.). In 1978 the first of the above sites,

now enclosed, was rapidly being converted into a dump for used cars and the like, and was no longer workable. Finally, by 1979, the inexorable march of "progress" had obliterated even the second site and destroyed the young poplars, after which the flies could no longer be found. Though all captures were in July, the insect was not sought in other months; it probably is about from June to at least August.

There seems, however, to be no reason why *H. hospes* should not still occur in some of the very suitable-looking areas near the railway, which can be seen from the train as one travels east from Plumstead and Abbey Wood. They could well be difficult of access, but poplars (if not also willows) abound there. Other likely spots exist on the western fringe of Thamesmead (the new conurbation extending east from Abbey Wood). Should some enthusiastic dipterist care to work the areas indicated before they too are swallowed up, I think it very probable that he might rediscover this species.

I am not aware of specific plant-associations in the Lauxaniidae, at all events in the British fauna; but in the case of *H. hospes*, its invariable occurrence on poplars and willows (and under no other conditions) was so consistent that it is difficult not to suspect something more than chance. The nature of the association, if real, remains to be shown.

Acknowlegements

I am greatly obliged to Mr Brian H. Cogan for the trouble he took in attempting to identify the original pair of this species, and to Mr P.J. Chandler for very kindly supplying me with a photocopy of the relevant part of Dr Papp's revision.

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Glyphipteryx linneella Clerck (Lep.: Cosmopterigidae) in Nottinghamshire

ON 24th June 1988 whilst examining trunks on common lime (*Tilia europeae*) bordering a school sports ground in the Carlton district, I boxed a beautiful and immaculate moth later identified as *Glyphipteryx linneella* Cl.

I was unaware of its status in Nottinghamshire, but knew it was unrecorded in neighbouring Derbyshire (*Butterflies and Moths of Derbyshire*, part 3: 1988), so I contacted Mark Sterling of the Derbyshire Entomological Society, who confirmed the identification. Joint trips to

find further specimens were initially unsuccessful, but Mark later secured a specimen and also found larval workings — small piles of rust-coloured frass — in the crannies of lime bark.

There is no general feeling for this moth's distribution, but Meyrick gives Kent, Middlesex, Berks, Gloucestershire and Cambridge with more recent records from London and Essex. Are there more northerly records for this species?

My thanks to Mark Sterling and Col. A.M. Emmet for their comments.
— A.S. Boot, 38 Balmoral Road, Colwick, Nottingham NG4 2GD.

Old records of two tineids (Lepidoptera) from Perthshire, Scotland.

The following two species of tineids are represented in the Buchanan White Collection of lepidoptera in Perth Museum by Scottish specimens: *Niditinea fuscella* (Linnaeus, 1758). A male specimen of this species (confirmed from male genitalia) is labelled No. 213. Buchanan White's notebooks do not give the specimen a name but indicate its origin as "Scotland, Perth (69)". The number stands for the year 1869. Pelham-Clinton (1985) in MBGBI Vol. 2 suggests that the most northerly Scottish records of this species, namely from v.c.88, require confirmation. It appears that the record is valid or at least it was in 1869. *Nemapogon variatella* (Clemens, 1859). According to Pelham-Clinton (1985) this species occurs mainly in the London area with a stray record as far north as Herefordshire (v.c.36). This restricted distribution must now be revised as four specimens of this species (confirmed from male genitalia) occur in the Buchanan White Collection. They are the residue of a series of six specimens numbered 230-235 whose identity and providence are given as "*Tinea granella*. Scotland, Perth (68)" and so were taken in the Perth area in 1868 possibly by Buchanan White himself or by William Herd. It seems that all specimens of this difficult genus must henceforth be checked very carefully.

I am grateful to Michael Taylor and Stephen Hewitt of Perth Museum for allowing me access to the Buchanan White Collection. — K.P. Bland, 35 Charterhall Road, Edinburgh EH9 3HS.

Some unseasonal larval dates

DURING the very mild winter of 1988/9 in the south-west I noted young larvae of *Aproaerema anthyllidella* (Hübner) mining leaves of *Anthyllis vulneraria* at Sandy Bay, Devon (v.c. 3) on 27th December and at Challaborough and Ayrmer Cove (v.c. 3) on 8th January.

At Portwrinkle, Cornwall (v.c. 2) on 1st January larvae of *Epermenia aequidentellus* (Hofmann) were found mining *Daucus carota* leaves; these produced moths on 24th and 31st January. — R.J. Heckford, 67 Newnham Road, Plympton, Plymouth.

"NO-SON" *PIERIS* FEMALES (LEP.: PIERIDAE)

S. R. BOWDEN

Lydeard, Merryfield Way, Storrington, West Sussex RH20 4NS.

AS REPORTED in 1987, I obtained in 1984 eggs from one or two wild *Pieris* (*Artogeia*) *napi* females, which eggs ultimately produced nearly 50 female adults and no males. Paired with various unrelated males, four of these reared females again each produced all-female 1985 broods, and further all-female generations were obtained in 1986 and 1987.

I confess that I have been breeding this species more or less continuously for over 40 years, but I have never previously encountered similar all-female broods. I wondered, of course, whether the phenomenon was localised in Storrington (where I was a newcomer), or had arisen only in recent years. Obviously one could not decide either question. As far as I could discover, females with no sons had long been known in several tropical butterfly species, but not in Palaearctic ones. Bowden (1987) discusses the ecological and evolutionary aspect of the situation.

In order to continue this and other breeding, in May 1988 I needed fresh wild-type *napi* males, and asked my friend Mr H.G. Short of Headley, Hampshire whether he could send me wild males, or normal females to produce them. On 14th May he brought me an apparently normal female caught in his garden, and a few days later sent me a male also taken there, with a female caught at Moor Park, Farnham, Hampshire.

The female from Moor Park gave me 10 eggs (1988-*y*), which in June produced five males and three females — a normal ratio.

I also caged the Headley female, which gave about 70 eggs (1988-*f*) on *Alliaria*. In June, 38 summer-type butterflies eclosed, all female; seven pupae over-wintered. Most of 1988-*f* were liberated near Fryern, Storrington, some after cage-pairing with 1988-*y* males. But two such females were caged for a short time and their eggs 1988-g^{i},g^{ii} retained: these gave three females in that year and 18 pupae went into diapause.

Assuming that the 18 over-wintering pupae also produce only females in 1989*, it would appear that an independent occurrence of no-son females has been found 20 miles from that at Storrington. The proximity in time is more impressive that that in space, so that one is now more inclined to believe that the no-son character in *napi* is recent but perhaps increasing.

It is generally accepted that no-son lines are able to spread in competition with normally bisexual ones, though if this advantage is maintained indefinitely the population must become extinct (see Bowden 1987). The ecology of the situation is not well understood, even for the long studied tropical species, and is certainly worthy of investigation in *Pieris napi* (and in any other English butterfly in which this heritable character may be detected).

*This proved to be the case.

I therefore suggest that entomologists should take females of *napi* at random (in localities apparently supporting a fairly stable population), and cage them individually for eggs, using any conveniently available food-plant of this species. About 30 eggs should be enough to give a statistically adequate number of adults. From any all-female brood at least one should be bred from, to confirm the heritability of the trait. Broods which are seen to include (easily distinguishable) male larvae can of course be discarded early. I recommend that nearly all bred insects be liberated at the original source locality.

Any positive findings should be reported, preferably to Dr T.G. Shreeve or Dr D.F. Owen, Department of Biology, Oxford Polytechnic, Headington, Oxford OX3 0BP.

Assessing sex-ratio disturbance

Abnormal sex-ratio can of course be produced in several ways that imply no special genetic mechanism. An apparent preponderance of males is probably the more usual case, sometimes attributable to the different habitual behaviour of the sexes: the males rushing about looking for females, while the latter sit around inconspicuously depositing eggs. Again, Larsen (1974), studying a large Lebanon population of the very visible *Zygaena carniolica* Scopoli, estimated the ratio there as two male : one female, but Shaw (1975) working with *Z. filipendulae* L. found that its Ichneumonid parasite *Mesostemidia obnoxius* (Gravenhorst) laid preferentially into the larger cocoons, which were predominantly female; this might have explained Larsen's findings.

However, a breeder raising adults from the eggs of known females, and losing very few individuals in the earlier stages (e.g. by disease) cannot explain the significant sexual inequality by involving other species. Genetic mechanisms can be expected to produce more extreme ratios than those caused by behaviour differences.

In small broods it may not be clear whether the departure from equality is significant. In any case, detection and assessment of "genetic" sex bias requires the isolation of the egg-batches of single females.

This is illustrated by a brood 1981-*w* raised by the writer from the eggs of TWO *napi* females taken from a locality in West Sussex (east of Amberley Wildbrooks). This probably mixed brood yielded four male and 18 female. The departure from equality of the sexes IS significant (Chi-squared with Yates' correction = 7.6, which gives P between 0.01 and 0.001). It may well be suspected that the two original females differed genetically, that one produced normally four male + four daughters, and the other about 14 females only. If so, the latter might have been of "no-son" character.

However, I bred from four of the 18 females in 1981-*w*, and all four gave bisexual broods without female bias. The chance of this result, if no-son heredity WERE involved as suggested, is about one in 3,000. So 1981-*w*

probably did *not* contain the female-only trait though some other genetic peculiarity may have been present.

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A diagnostic note on two species of *Cassida* L. (Col.: Chrysomelidae)

DIFFICULTY is sometimes experienced in separating the two closely similar tortoise-beetles, *Cassida vittata* Vill. and *C. nobilis* L., which in life share the striking feature of a metallic elytral stripe or horseshoe-mark (sg. *Cassidula* Weise). The character commonly given, relating to the form of the pronotal hind angles, is good, but, being a little variable and often very comparative, is not always easy to work with. Other criteria mentioned in the literature, concerning the frontal furrows and colour of base of femora, require to be examined from below, which cannot always be done without inconvenience.

I find that there is a useful and very evident difference in the sculpture of the (almost vertical) elytral sides below the humeral striae, in lateral view. In *vittata* this part is well marked off from that above, finely wrinkled and strigose, the scattered shallow punctures minute or even hardly visible, but in any case a mere fraction of the size of the large deep strial punctures. In *nobilis*, on the other hand, this lateral strip is not in strong contrast to the area above it, the punctures (except along the margin) being much larger and deeper — some often nearly as large as those of the striae — and with little trace of rugae or strigosity between them.

When there is any appreciable difference in general aspect, it is *vittata* which is slightly longer, lighter, and smoother-looking; while *nobilis* is slightly shorter, darker and rougher-looking.

Both species affect plants of the families Caryophyllaceae and Chenopodiaceae. Though *nobilis* is usually the one found inland (especially in chalky districts) and *vittata* on the coast or in saltmarshes, this seems only a general tendency and by no means to be relied on. I have not heard of their ever being found together, but have two specimens taken by H. Dinnage at Guildford (Surrey) in successive years, one of which is *vittata* and the other *nobilis*. I have myself found them only singly, and that infrequently. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

A key to the adults of British water beetles by **L.E. Friday**. 152 pp. Numerous figs. Field Studies Council, 1988. Limp, £7.50 or boards, £12.50.

This volume is published as one of the AIDGAP series (aids to identification in difficult groups of animals and plants) and is reproduced from the journal *Field Studies*. The first ten pages cover the structure of water beetles, using the key, collecting and a brief bibliography. The bulk of the text is devoted to keys, illustrated by drawings of the beetle body and relevant structural features. The book concludes with colour guides to the various groups, a size guide and a species checklist. As an insert there is a "quick-fit" chart showing the range of beetle sizes.

The reviewer's first introduction to entomology came through water beetles, and many hours were spent as a tyro wading not only through murky water but also through the comprehensive, but labyrinthine volumes of Balfour-Browne's *British water beetles*. Would this new publication be easier to use? The genera *Agabus* and *Ilybius* had always proved difficult, and *Gyrinus* impossible, so the opportunity to flex rusted memories on a new set of keys proved irresistible. The clear layout and careful construction of the keys made them very easy to use, and *Agabus* came out reasonably smoothly, as did *Ilybius* (but not *Gyrinus*!).

Dissection is necessary for a number of water beetles, and reasonably clear instructions are given for using genitalia preparations. On balance, a very useful book, reasonably priced and straight-forward to use.

Paul Sokoloff.

Pseudoscorpions by **Gerald Legg** and **Richard E. Jones**. 159 pp. Numerous text figures. Limp. E.J. Brill, 1988. US $36. ISBN 90 04 08770 2.

This volume is no. 40 in the new series *Synopses of the British Fauna*, a series of illustrated field and laboratory guides the first 28 of which were published by the Linnean Society.

For a synopsis, this slim volume is packed with information about this little-known group of arthropods. Chapters deal in considerable detail with general structure, reproductive biology, ecology, distribution, collection, preservation and preparation, classification, a key to adult British pseudoscorpions, systematic descriptions, a glossary and extensive bibliography. Each species is illustrated by a clear drawing, supplemented by structural details where appropriate and a distribution map.

This volume really classifies as a mini-monograph, and provides a fascinating insight into the biology of these creatures. The systematic section is a little heavy going for the non-specialist, but the ample glossary helps guide one through the sea of unfamiliar terms. Clearly, an invaluable guide for those interested in pseudoscorpions.

THE UNUSUAL CIRCUMSTANCES OF THE OCCURRENCE OF A MOST PECULIAR FORM OF *CHRYSODEIXIS CHALCITES* ESPER (LEP.: NOCTUIDAE)

G.M. HAGGETT

Meadows End, Northacre, Caston, Attleborough, Norfolk.

WE HAVE grown accustomed to moths from distant lands turning up in Britain as suspected introductions in one stage or another. To that number we must add the curious circumstances of another example of those hardy travellers the Plusiids, this time in the form of a last instar larva of *Chrysodeixis chalcites* Esp.

The visitor appeared on 16 February 1988 on a spray of exotic orchids given to a patient of the Norfolk and Norwich Hospital, Norwich. It was referred to the staff of Castle Museum who passed it to me. The larva looked rather like a pale *gamma* and spun its *gamma*-like cocoon within a couple of days after completing its growth on Geranium leaves. It was kept in a warm room and produced a female moth on 12th March.

The moth however looked like no other Plusiid in the European or Palaearctic literature and it was not until the following November that I could take it to the British Museum (Natural History) at South Kensington. There it was examined by the world specialist in the Plusiinae Dr I.J. Kitching who pronounced it to be *chalcites*, but a strange form that was quite unfamiliar. There was a group of British noctuid experts in the Museum on that occasion and the reaction of all was to ask Dr Kitching if he would be so kind as to have another look as none could really associate

Fig. 1. *Chrysodeixis chalocites* Esp. aberration (x 2.5).

this species with the specimen. Dr Kitching most generously re-examined the moth and its genitalia and confirmed the determination.

A glance at the accompanying photograph will tell why this specimen is so unlike typical *chalcites*: in lieu of the double tiny metallic spots the Norwich specimen has both spots joined and enlarged distally to form a broad silver wedge rather similar to that of *Diachrysia chryson* Esp. Then the specimen totally lacks the golden brassy pigmentation present in the lower median and distal wing areas of the typical insect, and instead presents the dulled purple clouded appearance of *gamma*. Finally the specimen has shorter, contracted forewings that changes its overall shape from the sharper angled wings usual in *Plusia* to a dumpy squat moth.

Acknowledgement

I am indebted to Dr Kitching for his kindness and forbearance in determining the identity of the oddity, to David Carter who acted as our go-between, and to the British Museum (Natural History) for permission to reproduce their photograph, as well as to Dr Irwin of Castle Museum, Norwich.

Acleris abietana (Hübn.) (Lep.: Tortricidae) in Aberdeenshire.

I have been prompted by recent comments on this species (Riley, A., 1988 *Ent. Rec.* **100**: 186-7, Young, M.R., 1989 *Ent. Rec.* **101**: 37-8) to report some further records. On 24.8.86 after much searching I finally beat out a fully grown green tortricoid larva from within a large stand of 15-20ft *Abies grandis* growing between mature *Larix*, in Kirkhill Forest (NJ857144). From this, an example of *Acleris abietana* (Hübn.) emerged, on 7.10.86. The stand is quite isolated after clear felling in 1985 and contains no spruce. Thus, unlike the pupae found by M.R. Young on *A. grandis* this larva cannot have moved from *Picea abies* and almost certainly fed upon *A. grandis*, unless *Larix* is another alternative but this seems unlikely. Larval spinnings were not located. The nearest stand of *P. abies*, some twenty yards from one corner of the *A. grandis* block was also searched and beaten the same day without success. I was unable to search earlier in the year, but mid-July to mid-August is probably a good period for larvae of this species, depending on the season. Clearly, it is worthwile searching the variety of fir and spruce species present in plantations, if *A. abietana* is known or likely to occur.

M.v. light was regularly operated beside the *P. abies* stand mentioned above (NJ856145). *A. abietana* was recorded as follows — 15.12.85 (one), 25.11.86 (four), 26.11.86 (one). My thanks to R.M. Palmer for confirming indentification. — M.C. TOWNSEND, 77 Lon Glanyrafon, Vaynor, Newtown, Powys SY16 1QU.

THE COLEOPTERA OF SHINGLE BANKS ON THE RIVER YSTWYTH, DYFED

A.P. Fowles

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THE INVERTEBRATE fauna of shingle banks has been rather neglected by ecologists in Britain and details of the life-history and habitat preferences of shingle beetles occur only as anecdotes reported in the entomological literature. Shingle banks are a generally hostile environment, subject to the annual upheavals of winter-spates and experiencing prolonged drought throughout the summer months and hence the fauna is highly-specialised and contains few eurytopic species. European studies have shown that many of the resident species occupy clearly-defined zones related to environmental parameters such as particle-size or water-retention capacity (Andersen 1978). This micro-habitat partitioning is important to our understanding of the conservation needs of the shingle fauna as threats arise to river-quality from channel-straightening schemes, impoundment and pollution. In central Europe, fears have already been expressed that community structure and diversity have been severely impaired along many of the major river systems (Plachter 1986), but the extent of similar reductions in diversity in Britain is unknown. There are still many rivers in the north and west which have largely escaped modification or pollution and identification of the chief factors contributing to the presence of the stenoecious species on river shingle may enable the formation of a conservation strategy to reduce the adverse effects of the continued pressures on the riparian environment.

In mid and west Wales there are several gravel-bed rivers which produce substantial areas of riverbank shingle; notably the Dyfi, Rheidol, Ystwyth, Wye, Severn, and Tywi. Until recently little was known of the composition of the fauna of Welsh shingle banks but in the last few years coleopterists have begun to discover that many species regarded as nationally rare can be found commonly in the Principality. Attempts have been made in 1987 and 1988 to investigate the invertebrate fauna of the Afon Ystwyth in Dyfed and this paper reports the results of those studies. The Ystwyth rises at an altitude of 490 metres above sea level on the western slopes of the Cambrian Mountains and flows for thirty-three kilometres before its confluence with the Afon Rheidol in Aberystwyth harbour. The catchment consists mainly of acidic grassland used as sheepwalk, although afforestation is widespread and dairying is frequent in the lower reaches on more fertile soils. During the eighteenth and nineteenth centuries the prevalence of lead-mining on the slopes of the upper valley led to severe pollution downstream but there has been a steady improvement in water-quality since the last mine closed in 1921 (Brooker & Morris 1980). Apart from a four-kilometre stretch in the middle reaches, the river is unmodified

and contains the best example of a braided river system in Wales. Gravel bars are a prominent feature of the alluvial floodplain and extensive shingle deposits occur throughout the length of the river, almost from source to mouth.

A typical shingle bank, developed on a point bar (the inside bend of a river meander) some six kilometres from the mouth, was chosen for study in 1987. Coarse pebbles formed the matrix of the bar but there were also zones of finer gravel deposits and pockets of silt which became vegetated with reed canary-grass *Phalaris arundinacea* and a variety of ruderal plants as the summer progressed. Behind the point bar, a broad platform of stabilised shingle supported mature gorse *Ulex europaeus* and broom *Cytisus scoparius* scrub with free-draining acidic grassland dominated by false oat-grass *Arrhenatherum elatius.* A series of eleven pitfall-traps was operated for a period of 20 weeks (9 May-26 Sept) on the unvegetated gravels. The traps were laid out in a transect across the width of the bar and sampled a range of different particle sizes; they were primed with 10% ethylene glycol as a preservative and emptied fortnightly. Traps were occasionally flooded after river levels rose following heavy rainfall but the bank was only completely flooded once, in early August. Further details of the trapping-programme are contained in Fowles, 1988.

A total of 770 beetles representing 50 species were captured during the course of the study and details are presented in Table. 1. This list is dominated by members of the Carabidae, Pselaphidae and Elateridae, which together contributed 84% of the total catch. The other family represented by more than a handful of individuals is the Staphylinidae, an important group on river shingle but one which rarely seems to be sampled efficiently by pitfall-traps. A high proportion of the species caught are generalists and have been recorded only as odd individuals that have strayed onto the bare shingle. This includes species such as *Barypithes pellucidus, Rhinosimus planirostris*, and *Carabus granulatus* that are distinctly out-of-place as members of the shingle fauna. In fact, perhaps only some fifteen species can be recognised as characteristic shingle inhabitants and only seven species are represented by ten or more individuals, despite the extensive sampling effort. These results serve to emphasise the highly-specialised nature of the habitat, supporting a limited range of species which tend to occur in some abundance. Of course, there are a number of fossorial species which will be rarely encountered, if at all, by a programme of pitfall-trapping and some cursorial species may be under-recorded as a result of their behavioural characteristics. However, repeated visits to this site suggest that the list gives a representative picture of the composition of the surface-active fauna.

A few of the species encountered in this survey call for additional comment. The ground-beetles feature prominently and their numbers are dominated by *Bembidion atrocoeruleum*, which is a widespread and common insect on Welsh river shingle. Many members of the Bembidiini

Table 1. Coleoptera caught in pitfall-traps on bare shingle at Ty'n-yr-helyg, Afon Ystwyth, Dyfed (22/595765) in 1987.

Carabus granulatus (1)	*Quedius molochinus* (1)
Carabus violaceus (2)	*Myllaena kraatzi* (1)
Bembidion lampros (1)	*Hydrosmectina subtilissima* (11)
Bembidion punctulatum (1)	*Aloconota insecta* (1)
Bembidion atrocoeruleum (113)	*Amischa analis* (3)
Bembidion andraea (2)	*Amischa soror* (1)
Bembidion femoratum (1)	*Philhygra malleus* (1)
Bembidion tetracolum (7)	*Mocyta fungi* (1)
Pterostichus madidus (1)	*Dimetrota atramentaria* (1)
Pterostichus niger (31)	*Brachygluta pandellei* (78)
Pterostichus nigrita agg. (1)	*Dryops ernesti* (2)
Calathus fuscipes (1)	*Dryops luridus* (5)
Agonum albipes (11)	*Oulimnius tuberculatus* (1)
Harpalus affinis (1)	*Hypnoidus riparius* (1)
Harpalus rufipes (7)	*Fleutiauxellus maritimus* (9)
Lionychus quadrillum (11)	*Zorochros minimus* (367)
Oreodytes septentrionalis (4)	*Cantharis livida* (1)
Ptenidium pusillum (1)	*Atomaria fuscicollis* (1)
Stenichnus pusillus (1)	*Coccinella quinqepunctata* (2)
Deleaster dichrous (4)	*Rhinosimus planirostris* (1)
Thinobius newberyi (2)	*Hydrothassa marginella* (1)
Anotylus rugosus (3)	*Chaetocnema hortensis* (1)
Lathrobium dilutum (7)	*Apion curtirostre* (2)
Gyrohypnus angustatus (1)	*Barypeithes pellucidus* (1)
Philonthus varians (1)	*Sitona lepidus* (1)

are recognised as having affinities with river shingle and, in Norway, Andersen has devoted a great deal of study to the understanding of their ecological preferences and adaptations (eg. Andersen 1969, 1978, 1983). Six species of the *Bembidion* genus were recorded at the study site at Ty'n-yr-helyg, Llanfarian (22/595765) and it is likely that micro-habitat partitioning enables them to co-exist on the same site (cf. Spence 1977). After *B. atrocoeruleum* it is somewhat surprising that *Pterostichus niger* was the next commonest carabid trapped as this species is normally associated with well-vegetated habitats (Lindroth 1985). Its occurrence on bare shingle is probably due to individuals foraging in the open at night away from their daytime-retreats in the gorse scrub above the riverbank. *Lionychus quadrillum* was the most unexpected carabid discovered inhabiting river shingle in west Wales, particularly as this small, diurnal species had not been reported in Britain since 1943 (M.L. Luff, pers.comm.). Previously it had been widely recorded from coastal shingle along the southern and eastern counties of England but the reasons behind its disappearance are unknown. In 1987 it was first found on the adjacent Afon Rheidol on 22nd April and subsequently at a total of seven sites on

the rivers Ystwyth, Rheidol and Tywi in Dyfed. In Spring adults were frequently seen hunting in some abundance on the fine, dry gravels of the upper parts of the shingle banks.

The Staphylinidae were not caught in great numbers but nonetheless there were several interesting species amongst the 15 recorded. Of prime importance was the capture of two specimens of the oxyteline *Thinobius newberyi* between 20th June and 18th July. *T. newberyi* is believed to be endemic to Britain and was known from only a handful of specimens collected from two river shingle sites — Great Salkeld in Cumbria (Britten 1909) and the River Druie at Aviemore in Easterness (Allen 1940). Repeated searches in these localities, particularly in the Spey Valley, have failed to rediscover the species (J.A. Owen, pers.comm.) and hence there had been no records anywhere in the world for almost fifty years. One of these specimens has been donated to the British Museum (Natural History) and the other to Manchester Museum. *Lathrobium dilutum* is another rare shingle staphylinid, known previously from just two areas in the Scottish Highlands — seven individuals were caught in the pitfall-traps at Ty'n-yr-helyg between 4th July and 12th September. Other nationally scarce staphylinids trapped during this survey were *Deleaster dichrous, Hydrosmectina subtilissima* and *Myllaena kraatzi.*

The pselaphid *Brachygluta pandellei* was first recorded on the Afon Ystwyth by the Rev. C.E. Tottenham in 1949 (Pearce 1953). It may be overlooked because of its small size but there have been very few records nationally in recent years. Pearce (1975) suggested that *B. pandellei* occurred in moss-cushions on riverbanks but experience on the Ystwyth indicates that, during the summer months, it is an abundant species on bare shingle where it presumably hunts springtails and mites. The click-beetle *Zorochros minimus* was by far the commonest species of Coleoptera caught during the survey and on some shingle banks in west Wales it can be extraordinarily abundant. *Fleutiauxellus maritimus*, on the other hand, is only encountered in small numbers, usually under stones near the water's edge but also occasionally in flight low over the shingle bank. Finally there is *Coccinella quinquepunctata*, not previously reported from Wales and with few records nationally this century. Full details of the discovery and occurrence of this species are reported by Majerus and Fowles (In Press). Adults can be common in Spring, feeding on aphids living on broom bushes growing along the upper edge of the shingle bank, but when this food supply is exhausted they disperse to knapweeds *Centaurea nigra*, thistles *Cirsium* spp. and willows *Salix* spp. in the vicinity. The larvae appear in mid-summer and also occur on these plants, although they are often seen roaming around on the bare shingle and were also captured in the pitfall-traps.

In 1988 attention was focused on the distribution of ground-beetles along the length of the Afon Ystwyth. Between 12th and 30th April, 37 shingle banks were sampled by hand-searching for a set time-period; a

technique employed previously on river shingle in Norway (Andersen 1968) and Germany (Plachter 1986). The European studies demonstrated altitudinal patterns of distribution for the carabid fauna of river shingle and the present survey was designed to investigate whether similar patterns existed on the Ystwyth. The method employed was to turn over surface pebbles across the width of the bare shingle for a set period of twenty-five minutes, collecting all ground-beetles seen with a pooter. This enabled approximately 12 square metres to be surveyed in this manner on each bank. Shingle bars in the uppermost reaches of the river were too small to sample for the full 25 minutes and hence a series of smaller banks were sampled at each survey station to make up the necessary survey period. At the highest altitudes, only one kilometre from the source where the river is only a narrow stream cutting through blanket peat, there was not enough shingle to complete a full survey and the uppermost station consisted only of an eight-minute sample. Sites were chosen at roughly one kilometre intervals except near the river mouth where three banks were sampled to investigate more fully the tidal influence upon the fauna.

Fifteen hours and eight minutes were spent hand-searching and a total of 692 carabids was recorded, involving 27 species (Table 2.). As with the pitfall-traps, the majority of species were represented by few specimens and only six species were recorded in sufficient numbers to attempt to interpret their patterns of distribution. The presence or absence of these beetles at each sampling station is depicted on the accompanying maps (Fig. 1.).

Bembidion atrocoeruleum is by far the commonest and most widely distributed species inhabiting shingle banks along the Ystwyth; it was recorded from shingle within the tidal reaches at the river mouth to 305 metres above sea level (a.s.l.) in the upper valley. Only four of the stations in between did not support *B. atrocoeruleum* and they were all sites where the bank profile was shallow, resulting in frequent flooding in response to small rises in river level. Interestingly, at each of these sites *Agonum albipes* was dominant or co-dominant. *A. albipes* was the only carabid inhabiting shingle at both the highest and lowest altitudes but it was relatively scarce in the middle and lower reaches (apart from station 4 which was a shallow bank composed of gravels mixed with a high proportion of silt). *Bembidion decorum* occurred as high as 250 metres a.s.l. but was rarely abundant. It reaches its maximum densities in the lower valley where it appears to favour broad, flat banks.

Three species displayed a restricted distribution altitudinally along the Ystwyth, the most extreme of which was *Bembidion maritimum*. This is normally regarded as a saltmarsh species (Lindroth 1985) but on the Ystwyth it is abundant under stones on bare shingle with fine gravels and silts within the tidal reaches. However, there were no individuals recorded on similar banks beyond the High Water Mark of Ordinary Tides. This short brackish stretch is unique in Dyfed as no other rivers produce shingle banks this close to the sea. Subsequent investigations have revealed the

Table 2. The altitudinal distribution of ground-beetles recorded at selected river shingle sites during timed hand-searches (25 minutes duration) on the Afon Ystwyth, Dyfed in 1988.

Sampling Station	Altitude (Metres)	Agonum albipes	Bembidion atrocoeruleum	Bembidion decorum	Bembidion maritimum	Bembidion punctulatum	Bembidion tibiale	Other Species
1	1	3	6	1	100	—	—	
2	1	1	2	—	32	7	—	
3	1	2	11	1	—	7	—	*Bembidion lampros* - 1
4	2	22	—	—	—	6	—	*Clivina collaris* - 1
								Agonum marginatum - 1
								Amara aenea - 1
5	8	—	4	—	—	—	—	
6	10	—	7	3	—	3	—	
7	17	—	16	1	—	1	—	*Bembidion andraea* - 1
8	20	1	15	—	—	6	—	*Bembidion andraea* - 1
								Lionychus quadrillum - 1
9	21	—	4	4	—	1	—	*Loricera pilicornis* - 1
								Agonum muelleri - 1
10	24	—	11	10	—	10	1	
11	27	2	21	4	—	—	—	*Bembidion femoratum* - 1
12	30	3	12	12	—	—	—	
13	37	—	6	1	—	—	—	*Bembidion tetracolum* - 1
								Bembidion guttala - 1
								Notiophilus substriatus - 1
14	42	—	9	2	—	—	—	*Bembidion andraea* - 1
15	50	—	5	—	—	—	—	*Notiophilus aquaticus* - 1
16	58	3	5	—	—	—	3	
17	62	—	15	—	—	—	—	
18	70	1	4	1	—	—	—	*Bembidion andraea* - 3

Sampling Station	Altitude (Metres)	Agonum albipes	Bembidion atrocoeruleum	Bembidion decorum	Bembidion maritimum	Bembidion punctulatum	Bembidion tibiale	Other Species
19	75	—	6	—	—	—	—	*Bembidion andraea* - 1
20	80	—	4	2	—	—	—	*Bembidion andraea* - 1
21	90	3	7	7	—	—	—	*Bembidion tetracolum* - 1
22	95	13	—	1	—	—	15	*Agonum muelleri* - 1
								Bembidion tetracolum -1
23	110	14	—	—	—	—	3	
24	125	3	3	1	—	—	7	
25	130	1	10	—	—	—	4	*Bembidion andraea* - 1
								Bembidion tetracolum -5
26	145	1	28	2	—	—	7	
27	165	4	—	—	—	—	1	*Bembidion lunulatum* - 1
								Pterostichus niger - 1
								Loricera pilicornis - 1
28	185	—	13	—	—	—	—	*Notiophilus biguttatus* - 1
29	200	—	12	1	—	—	—	*Notiophilus biguttatus* - 2
								Nebria brevicollis - 1
								Bembidion lampros - 1
30	220	2	12	—	—	—	—	
31	240	1	11	—	—	—	2	*Bembidion andraea* - 2
32	250	2	2	1	—	—	2	*Nebria salina* - 1
33	305	7	2	—	—	—	4	
34	320	2	—	—	—	—	3	
35	365	6	—	—	—	—	1	
36	410	3	—	—	—	—	—	*Pterostichus nigrita agg.* - 1
37	440	1	—	—	—	—	—	*Bembidion nitidulum* - 1
								Pterostichus nigrita agg. - 2

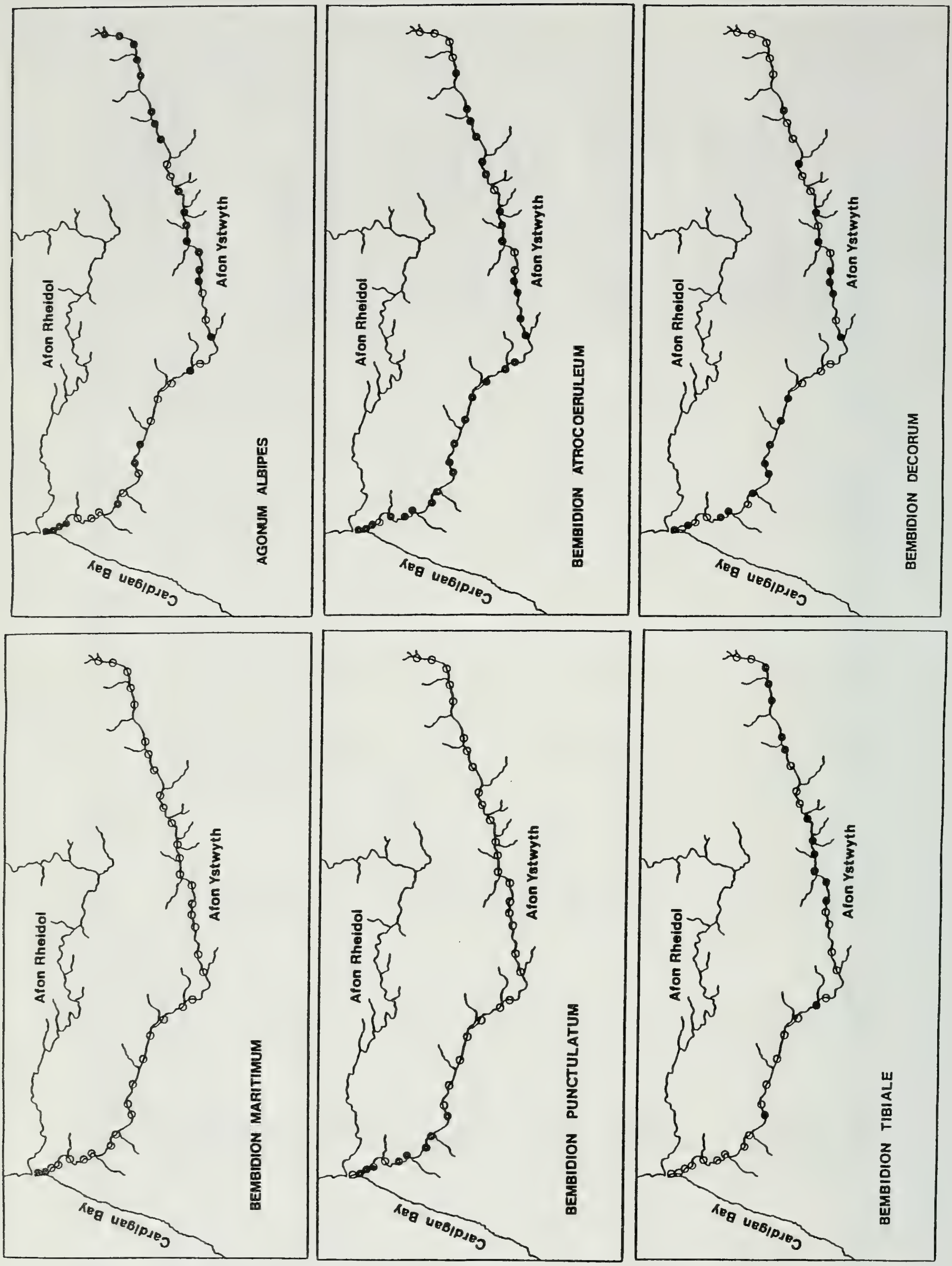

Fig. 1. The occurrence of selected ground-beetles (Col.: Carabidae) at river shingle sites on the Afon Ystwyth, Dyfed.
(● Species present, ○ species absent from sample.)

presence of other coastal ground-beetles in this stretch — *Aepus marinus, Bembidion laterale*, and *Trechus fulvus* — a most unusual assemblage of river shingle carabids. *Bembidion punctulatum* is another species which has a restricted distribution on the Ystwyth, occurring only on shingle banks in the lowest nine kilometres of the river up to an altitude of just 24 metres a.s.l. Elsewhere in Britain this species occurs further inland and at much higher altitudes and there is no obvious explanation for its apparently limited distribution on the Ystwyth. Lastly, there is *Bembidion tibiale*, which is frequent in the upper valley but was found at only two of the 29 sampling stations below 90 metres a.s.l. However, altitude does not appear to be a limiting factor as *B. tibiale* is common on the streamside shingle of low-lying tributaries of the Ystwyth. The two sampling stations at which it was present in the lowlands were both partially overshaded by trees, a feature common to its streambank sites, and it may be that temperature levels are critical to its distribution.

Few of the other carabids recorded during this survey are true shingle species. The five *Bembidion* species (*andraea, femoratum, lunulatum, nitidulum* and *tetracolum*) are probably resident in small numbers but the only other carabids likely to breed in this habitit are *Lionychus quadrillum* and *Clivina collaris*. It is interesting that *L. quadrillum* was only found at station 8, which is the Ty'n-yr-helyg site where it was caught in the pitfall-trap survey of the previous year. However, in 1987 it was also found at another nearby site on the Ystwyth and is likely to occur in small numbers on several banks in the lower reaches. *C. collaris* is a subterranean species which cannot be expected to be adequately sampled by either of the survey methods employed and it has been seen at several other localities along the river when shingle has been excavated below the surface layers, particularly in fine gravel zones with seasonal vegetation.

Casual recording of beetles from other families seen during the survey produced records of five nationally uncommon species — the staphylinids *Deleaster dichrous, Lathrobium angusticolle*, and *Neobisnius prolixus*; the pselaphid *Brachygluta pandellei*; and the ptilid *Ptenidium brenskei*. Eleven specimens of *D. dichrous* were recorded from sites all along the river up to 305 metres a.s.l. Both this species and *N. prolixus* (of which there were just two records) are widely distributed in Britain and are perhaps best regarded as generalist hygrophiles with no specific affinity for river shingle. *L. angusticolle* and *P. brenskei* are more localised and are found on shingle banks of northern and western rivers; two specimens and a singleton respectively were taken in the lower half of the Ystwyth. The occurrence of *B. pandellei* on the Afon Ystwyth is discussed above; four individuals were encountered in the lower valley.

A final method which has been used to catalogue the coleopteran fauna of the Ystwyth river shingle is excavation. This reveals species which are essentially subterranean in nature, including a number of carabids, staphylinids, etc. . . . Shingle is excavated down to the water-table and the

resultant hole allowed to fill with water, it is then possible to slowly collapse the sides of the hole and beetles can be collected as they swim on the surface of the water. At Grogwynion (22/707719), in company with J.A. Owen and D.C. Boyce on 22nd August 1988, several *Bibloplectus minutissimus* (Col.: Pselaphidae) were found by this method (probably the first record for Wales) along with *Brachygluta pandellei* and the aleocharine *Hydrosmectina subtilissima*. On a nearby bank *Hydrosmecta eximia* and *Atheta incognita* were recorded. The following weekend, 27th August, I excavated an area of fine gravels along the river's edge at Ty'n-yr-helyg which was partially vegetated by reed canary-grass and knapweed. This produced a total of five specimens of *Thinobius newberyi*, one *Philhygra scotica* and sixteen *Acrotrichis fascicularis*.

The fact that five *T. newberyi* can be found in one small excavation on a fairly typical shingle bank suggests that the species is at least common at this site and it is possible that it is widespread in this habitat along the river. This highlights a problem with the evaluation of shingle faunas as so few comprehensive surveys have been carried out nationally that rarity status is all-too-often a reflection of observer bias. I think it is clear from the foregoing that the Afon Ystwyth supports an excellent shingle fauna but whether or not this is characteristic of Welsh gravel-bed rivers will require further extensive surveys before assessment is possible. Rivers in lowland Britain are continuously under threat from a variety of sources and conservation organisations must be in possession of authoritative information if they are to be able successfully to protect riparian habitats. I would be grateful to receive details of other surveys of Welsh river shingle by entomologists for all invertebrate groups in order to establish a database for practical use. River shingle is a neglected habitat that is almost entirely the province of the invertebrate zoologist; its conservation demands greater attention than it has received so far.

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Appendix

Coleoptera recorded on unvegetated shingle banks of the Afon Ystwyth, Dyfed during 1987 and 1988.

CARABIDAE

Carabus granulatus L., *Carabus violaceus* L., *Nebria brevicollis* (F.), *Nebria salina* Fairmaire & Laboulbene, *Notiophilus aquaticus* (L.), *Notiophilus biguttatus* (F.), *Notiophilus substriatus* Waterhouse, G.R., *Loricera pilicornis* (F.), *Clivina collaris* (Herbst), *Aepus marinus* (Strom), *Trechus fulvus* Dejean, *Bembidion lampros* (Herbst), *Bembidion punctulatum* Drapiez, *Bembidion atrocoeruleum* Stephens, *Bembidion tibiale* (Duftschmid), *Bembidion andraea* (F.), *Bembidion decorum* (Zenker), *Bembidion femoratum* Sturm, *Bembidion maritimum* Stephens, *Bembidion nitidulum* (Marsham), *Bembidion tetracolum* Say, *Bembidion laterale* (Samouelle), *Bembidion guttula* (F.), *Bembidion lunulatum* (Fourcroy), *Pterostichus madidus* (F.), *Pterostichus niger* (Schaller), *Pterostichus nigrita agg.* (Paykull), *Calathus fuscipes* (Goeze), *Agonum albipes* (F.), *Agonum marginatum* (L.), *Agonum muelleri* (Herbst), *Amara aenea* (Degeer), *Amara plebeja* (Gyllenhal), *Harpalus affinis* (Schrank), *Harpalus rufipes* (Degeer), *Lionychus quadrillum* (Duftschmid).

DYTISCIDAE

Oreodytes septentrionalis (Sahlberg, C.R.).

PTILIDAE

Ptenidium brenskei Flach, *Ptenidium pusillum* (Gyllenhal), *Acrotrichis fascicularis* (Herbst).

SCYDMAENIDAE

Stenichnus pusillus (Muller & Kunze).

STAPHYLINIDAE

Lesteva longoelytra (Goeze), *Lesteva pubescens* Mannerheim, *Deleaster dichrous* (Gravenhorst), *Ochthephilus omalinus* (Erichson), *Thinobius newberyi* Scheerpeltz, *Anotylus rugosus* (F.), *Anotylus tetracarinatus* (Block), *Stenus guttala* (Muller, P.W.J.), *Stenus juno* (Paykull), *Lathrobium angusticolle* (Boisduval & Lacordaire), *Lathrobium dilutum* Erichson, *Lathrobium multipunctum* Gravenhorst, *Medon brunneus* (Erichson), *Gyrohypnus angustatus* Stephens, *Xantholinus longiventris* Heer, *Neobisnius prolixus* (Erichson), *Philonthus nigrita* (Gravenhorst), *Philonthus varians* (Paykull), *Staphylinus erythropterus* L., *Quedius molochinus* (Gravenhorst), *Myllaena kraatzi* Sharp, *Hydrosmecta eximia* (Sharp), *Hydrosmecta thinobioides* (Kraatz), *Hydrosmectina subtilissima* (Kraatz), *Aloconota cambrica* (Wollaston), *Aloconota gregaria* (Erichson), *Aloconota insecta* (Thomson, C.G.), *Aloconota sulcifrons* (Stephens), *Amischa analis* (Gravenhorst), *Amisca soror* (Kraatz), *Philhygra malleus* Joy, *Philhygra scotica* (Elliman), *Mocyta fungi* (Gravenhorst), *Atheta incognita* (Sharp), *Dimetrota atramentaria* (Gyllenhal), *Halobrecta flavipes* Thomson, C.G., *Aleochara lanuginosa* Gravenhorst.

PSELAPHIDAE

Bibloplectus minutissimus (Aube), *Brachygluta pandellei* (Saulcy).

DRYOPIDAE

Dryops ernesti des Gozis, *Dryops luridus* (Erichson).

ELMIDAE

Oulimnius tuberculatus (Muller, P.W.J.).

ELATERIDAE

Hypnoidus riparius (F.), *Fleutiauxellus maritimus* (Curtis), *Zorochros minimus* (Boisduval & Lacordaire).

CANTHARIDAE

Cantharis livida L.

CRYPTOPHAGIDAE

Paramecosoma melanocephalum (Herbst), *Micrambe vini* (Panzer), *Atomaria fuscicollis* Mannerheim.

COCCINELLIDAE

Subcoccinella 24-punctata (L.), *Coccinella 5-punctata* L., *Coccinella 7-punctata* L., *Coccinella 11-punctata* L.

SALPINGIDAE

Rhinosimus planirostris (F.).

CHRYSOMELIDAE

Oulema melanopa (L.), *Hydrothassa marginella* (L.), *Chaeteocnema hortensis* (Fourcroy).

APIONIDAE

Apion curtirostre Germar, *Apion violaceum* Kirby, W., *Apion virens* Herbst.

CURCULIONIDAE

Barypeithes pellucidus (Boheman), *Sitona lepidus* Gyllenhal, *Hypera arator* (L.), *Notaris acridulus* (L.), *Rhynchaenus fagi* (L.).

Immigrant Lepidoptera at Dungeness in October 1988.

The autumn of 1988 proved to be an exciting period for entomologists in the Dungeness/Greatstone area of South-east Kent. All the records in this account have been incorporated into the annual records of immigration published in this Journal, and relate to moths taken by myself, B. Banson, M. Parsons and R. Morris. I myself had one or two m.v. lights running permanently at my house at Dungeness and also ran m.v.s in the Dungeness sallows and at Greatstone sands during this period. BB had an m.v. running at his house at Greatstone throughout and MP and RM were jointly running an m.v. positioned near the Bird Observatory at Dungeness and had additional actinic traps stationed in the sallows.

The first noteworthy migrant was a single male *Mythimna vitellina* Hübn. at Greatstone on 15th October, and when two more *vitellina* and no less than three male *Heliothis armigera* Hübn. turned up at Dungeness on the night of the 19th, it was obvious that the mild conditions and south to south-easterly winds were starting to fulfil their promise.

The following three nights proved comparatively quiet, although the 20th October produced single males of *armigera* and *Peridroma saucia* Hübn. at Dungeness and the 21st saw singles of *vitellina* and *saucia* at Greatstone and a very striking form of *Nycteola revayana* Scop. taken at Dungeness may have been of continental origin. The night of the 22nd had none of the scarcer immigrant species although both *Agrotis ipsilon* Hufn. and *Nomophila noctuella* D. & S. were in good numbers, as they were throughout this period.

The following two nights were exceptional. The night of the 23rd produced no less than eight *Orthonama obstipata* Fab., comprising four males at Dungeness and three males and a single female at Greatstone; two male *armigera* and a female *Rhodometra sacraria* L. at Greatstone (one of the *obstipata*, one *armigera* and the *sacraria* came from an Estate Agent's lighted window!); three male *vitellina* at Dungeness, and the prize of the night a single, slightly-worn male *Mythimna loreyi* Dup. at Greatstone. Michael Chalmers-Hunt informs me that this is the first confirmed record for Kent. A second Kent specimen was taken a few nights later by Paul Sokoloff, at Orpington, on 26th October.

On the evening of the 24th, MP, RM and myself flushed literally hundreds of *noctuella*, with smaller numbers of *Udea ferrugalis* Hübn. from the vegetation at the back of Greatstone Dunes, but the following night was to produce more notable migrants. These included another male

armigera at Dungeness, three male *obstipata* from Greatstone, four male *Spodoptera exigua* Hübn. (three at Dungeness and one at Greatstone) and, pick of the bunch, a superb female *Cyclophora puppillaria* Hübn. which subsequently laid a considerable number of fertile eggs.

The night of the 25th, much to the disappointment of Fred Butcher, Dick Chatelain, Paul Sokoloff and Denis O'Keeffe who joined us at the Dungeness sallows, was clear, cold and rather windy. Apart from clouds of *noctuella* and *ipsilon*, a fine male *Palpita unionalis* Hübn. was taken, and a further male *obstipata* was seen at Greatstone.

That night signalled the beginning of the end for the October immigrants and the only other notable migrants taken during the rest of the month were a single male *armigera* and a female *obstipata* both at Greatstone on the night of the 27th. — S.P. CLANCY, Delhi Cottage, Dungeness, Kent TN29 9NE.

***Xylena exoleta* Linn., the Sword-grass, (Lep.: Noctuidae) in Oxfordshire.**
On the morning of 30th March 1989 a male *Xylena exoleta* was taken at my garden m.v. trap at Fernham, Oxfordshire. On the following night a specimen of *Agrotis ipsilon* Hufn. was taken, suggesting that *exoleta* was probably an immigrant. — S. NASH, Goldsmiths, The Green, Fernham, Oxon SN7 7NT.

A note of the occurrence of *Xylena exsoleta* L. (Lep.: Noctuidae) in southern England.
Certainly for the last thirty years and probably for much longer there has been no evidence that *Xylena exsoleta* L. has existed as a resident in southern England; this area being defined as south of a line running from the Severn to the Wash. In this period there has been ten fully acceptable records and although such a small sample prevents any conclusive analysis, both the coastal locations of most of the captures and the correlation of records in 1949, 1957 and 1964 strongly suggests immigration from the Continent.

There are several other species in the subfamily *CUCULLIINAE* which are noted immigrants and those in the taxonomic order closest to *exsoleta* are *Lithophane furcifera* Hufn., *Lithomoia solidaginis* Hb., *Calophasia lunula* Hufn. and *Trigonophora flammea* Esp.

Record of *exsoleta* from 1949-1988: 24.ix.49, Dungeness, Kent; 11.x.49, Maidencombe, Devon; 12.x.53, Redruth, Cornwall; vi.55, Buxted, Sussex; 8.iii. and 1.xi.57, Bradwell on Sea, Essex; 25.x.57, Bodinnick, Cornwall; 4.x.64, Dungeness, Kent; 31.x.64, Bradwell on Sea, Essex; x.68, Black Torrington, Devon; 7.x.78, Freshwater Bay, Isle of Wight. There are two further published records which I was unable to confirm, but are possibly genuine, and these are 1977 Stapleford, Sussex and x.77, Maulden, Bedfordshire. — BERNARD SKINNER.

PHILUDORIA POTATORIA L. (LEP.: LASIOCAMPIDAE): A REMARKABLY HOMOGENEOUS POPULATION

B.K. West, B.Ed.

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J.W TUTT (*British Lepidoptera,* 1902) states "This species is exceedingly variable" and in a subsequent paragraph he proceeds to name and describe about a dozen forms which might be described as somewhat arbitrary points on a cline, and so one meets many specimens difficult to categorise due to their being intermediate in character. In relation to male forms he mentions that "All these forms occurred at Wicken during the first week of August, 1892", and he then lists their relative frequency. *P. potatoria* in Britain is variable in several senses; firstly it possesses pronounced sexual dimorphism, and both sexes vary considerably; secondly local populations tend to be variable and also differ one from another, while superimposed upon this are certain general trends of variation on a broader geographical basis. The larvae are to be found in several well-defined habitats in which their foodplant is characteristically different one from another.

J.M. Chalmers-Hunt (*Butterflies and Moths of Kent,* 1968) contributes some brief remarks on variation of *potatoria* in the county. He suggests that f. *diminuta* Tutt is the commonest male form, and that the nymotype is the most frequent female form, although f. *lutescens* Tutt is also common.

I am acquainted with this species from a number of Kentish localities — the lower Thames marshes, the Stour marshes, Sandwich, Romney Marsh, Dungeness, the Orlestone woods and the Tunbridge Wells area including the former Broadwater Forest just over the border in Sussex, formerly a fine heathland with mixed woodland, destroyed by the Forestry Commission. With one exception the *potatoria* populations of these areas are very variable, and also the local populations vary one from another.For example around Tunbridge Wells in the 1930s and early post-War years all females I bred were *lutescens,* which varied greatly in depth of ground colour and markings. On the other hand in the Orlestone woods of East Kent males usually have increased yellow coloration, many approaching f. *proxima* Tutt, a form which is, I believe, uncommon elsewhere in Kent. In Kent in general, excluding the Orlestone woods and the lower Thames marshes, I have found that most males would seem to be either f. *intermedia* Tutt or to fall between this and f. *diminuta.* Regarding the females, excluding the lower Thames marshes and Tunbridge Wells area, the three main forms appear to be encountered — type specimens in various shades of yellow, the orange-yellow *lutescens* and the pale ferruginous f. *berolinensis* Heyne, plus specimens difficult to categorise due to their intermediate character.

Until recently the caterpillars of this moth were very common on the Thames marshes between Gravesend and Higham where they fed upon the reeds (*Phragmites australis*) growing alongside the numerous ditches and the Gravesend-Higham Canal. During the 1930s and in the earlier post-War years I collected many larvae, usually when they were nearly full-grown, and also cocoons, both being easily found by day, and most eventually produced moths which indicate that this area has a population of *potatoria* probably quite unique in Britain, although there are indications that the population on the north bank of the Thames opposite may be similar, this conclusion being based upon examination of the National Collection at South Kensington. Both sexes exhibit minimal variation; the males might be described as somewhat aberrant specimens of f. *diminuta*, being of a rich, deep chocolate brown colour and possessing a purplish sheen reminiscent of that of the darker forms of *Gastropacha quercifolia* L., with the yellowish basal patch against the termen of the forewing and a well-defined pale streak from the discoidal to the oblique line, but not passing beyond as in typical *diminuta*. Sometimes there is some slightly paler scaling between the oblique line and the scalloped subterminal, but this is less pronounced than in specimens from elsewhere in Kent. The females are the pale ochreous *berolinensis* with weak markings, and without the darker shading on the posterior half of the hindwing; f. *lutescens* seems to be absent. Thus this Thames marshes population is perhaps uniquely homogeneous, being composed of but two forms, one for each sex, which are remarkably invariable, together with the absence of f. *lutescens* which seems to occur in all other Kentish localities.

In 1987 and 1988, wishing to breed further examples of this moth from the Thames marshes in order to confirm my findings, I searched the reed beds at the appropriate time, but was unable to find a single caterpillar.

***Mythimna vitellina* Hübn. and *Heliothis peltigera* D. & S. (Lep.: Noctuidae) in Lancashire — a correction.**

In the supplement to the immigration notes published in *Ent. Rec.* **101**: 132 I regret there was an error in my recording *Mythimna vitellina* from Lancashire North (v.c.60) in 1986. This entry should be deleted, and appear as follows:

Heliothis peltigera D. & S. LANCS.N., v.c.60 Presall, 27.6
(R.E. Danson per M. Evans)

Both species are rarely seen in Lancashire, and this record of *peltigera* is by a long way the furthest north example reported in 1986. — R.F. Bretherton.

THE IMMIGRATION OF LEPIDOPTERA TO THE BRITISH ISLES IN 1988

R.F. Bretherton[1] and J.M. Chalmers-Hunt[2]

[1] *Folly Hill, Birtley Green, Bramley, Guildford, Surrey GU5 0LE*

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(Concluded from page 159)

ANNEXE I

Names of Recorders

Allen, Dave (Ireland), Austin, Rich (Guernsey), Baker, B.R., Baker, Paul, Baldwin, A.J., Baldock, D.W., Banner, Dr J.V., Bond, K.G.M. (Ireland), Bowes, Dr J.M. Bradley, Dr J.D., Bretherton, M.F., Bretherton, R.F., Brown, D.C.G., Brown, Evelyn P., Brown, Jill (Ireland), Brownfield, Mrs O.M., Bryan, M.D., Bushell, Mrs S., Burton, J.F., Butcher, A., Cade, Martin, Campbell, J.L., Chalmers-Hunt, J.M., Chambers, D., Chaney,J.E., Chatelain, R.G., Church, S., Clancy, S., Clarke, Dr Julian, Clarke, Mrs R.K.F., Collins, C.B., Colmans, J., Corley, M.F.V., Costen, Dr P.D.M. (Guernsey), Cox, R., Dacie, Sir John, Dewick, A.J., Dewick, S., Dey, D., Dobson, A.H., Down, D., Drakeford, J., Eastwick-Field, Lt Col G.G., Easterbrook, M.A., Edwards, Mrs A., Elliott, R., Else, G.R., Evans, Malcolm, Evans, S.J., Fairclough, R., Foster, Andrew, Gardner, A.F.J., Goater, B., Green, G.E., Greenwood, J.A.C., Hall, N.M., Halsey, J., Harmer, A.S., Harwood, N.W., Haynes, R.F. (Ireland & Man), Heckford, R., Henwood, B.P., Higginson, J.E., Higgs, G.E. (Guernsey), Hopkins, D., Hornby, R.J., Hulme, D.C., Hughes, L.E., Hunter, I., Ivon-Jones, B., Jacobs, S.N.A., Johnstone, Daphne, Jones, Mrs P., Kelly, Sylvia, Knill-Jones, R. & S.A., Lane, R.E. & C.G., Laney, P.E., Larsen, T.B., Lavery, J.W., Leaver, R., Leverton, R., Lewis, R., Lorimer, R.I., McCormick, R., Madge, S.C., Mallett, N., Mark, E.R., Miles, Dr J., Mitchell, B.R., Moore, B.W., Morgan, I.K., Morris, I.R., Myers, Dr A.A. (Ireland), Nash, S., Oates, M., O'Heffernan, H., O'Keeffe, D., Owen, John, Owen, D.F., Palmer, S.M., Parsons, M., Passley, P.R., Payne, J.H., Peet, T.N.D., Pelham-Clinton, E.C., Phillips, J.W., Pickles, A.J., Plant, C.W., Pool, M., Potts, P.M., Pratt, C.R., Pratt, R., Radford, J.T., Riddiford, N.J., Rippey, I. (Ireland), Rogers, M., Rollins, C.C., Rutherford, C.I., Rushen, D., Sankey-Barker, J.P., Semmens, M.P., Senior, G., Simon, G., Simpson, G., Slade, B., Skinner, Bernard, Smith, E.C. & M., Smith, Dr F.H.N., Smith, I.F., Smith, R., Softley, R.A., Sokoloff, P.A., Spalding, Adrian, Spence, B.R., Sterling, Col D.H., Stokes, Mrs Susan, Sutcliffe, R., Sutcliffe, S.J., Swanson, S., Tallack, R., Townsend, Martin, Tucker, Nigel, Tucker, Victor, Waite, P., Waring, Paul, White, P., Whiteside,J., Wild, E.H., Wilson, J., Winter, P.Q., Wright, R.W., Yates, B.

ANNEXE II

Records of scarcer immigrant species in 1988

Suspected immigrants of resident species are marked *. Records of nocturnal species are of those found in traps or otherwise at light unless otherwise stated, and dates of them are as far as possible for the beginning of each night. Initials are used for recorders who have sent in long lists, but others are given in full. Figure 3 illustrates the distribution of some of the scarcer species.

	Palpita unionalis	*Rhodometra sacraria*	*Orthonama obstipata*	*Agrius convolvuli*	*Mythimna vitellina*	*Mythimna loreyi*	*Spodoptera exigua*	*Heliothis armigera*	*All others*
January	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0
April	0	0	1	0	0	0	0	0	0
May	0	0	1	0	0	0	0	0	2
June	0	0	0	0	0	0	0	0	1
July	0	2	0	0	1	0	10	0	3
August	0	9	0	4	0	0	26	0	9
September	0	28	0	9	2	0	103	13	12
October	34	52	60	4	21	7	42	55	20
November	6	3	1	0	0	2	1	13	5
December	0	0	0	0	0	0	0	0	0
TOTALS	**40**	**94**	**63**	**17**	**24**	**9**	**182**	**81**	**52**

Fig. 3. Numbers of scarcer immigrant Lepidoptera (adults only) in 1988.

Sclerocona acutellus Eversmann. HANTS N. Leckford, 8.8, one in trap. First British record (Sterling, *Ent.Gaz.* **40**: 1-3). Possibly immigrant.

Euchromius ocellea Haw. (6). DEVON S. Abbotskerswell, 3.11 (BPH). DORSET Studland, 23.10 (DCGB). HANTS ISLE OF WIGHT, Freshwater 21.9, 20.10, 12.11 (SAK-J). HANTS S. Ringwood, 12.11 (Dr J. Clarke).

Hellula undalis Fab. CORNWALL W. Cusgarne, near Truro, 21.10. Probably only second British record (AS). A sub-tropical species, agreeing in date with other immigrants. The first British record was of one at East Prawle, DEVON S. 28.9.1967 (E.J. Hare).

Uresiphita polygonalis D. & S. CHESHIRE Wallasey, 16.9 (M.F.V. Corley (*Ent. Gaz.* **40**: 1-3) & BENHS Exhib, 1988).

Ostrinia nubilalis Hb. (12) HANTS S. Ringwood, 8.8 (Dr J. Clarke). SUSSEX W. Walberton, 10.7, 16.7, 8.9, two (JTR per CRP). SUSSEX E. Peacehaven, 23.6, two, 7.8, two, 22.10 (CRP). Co CORK MID Fountainstown, 7.9, 9.9 (AAM). Some may have been immigrants, but it is now widely established in south east England, though little known in Ireland.

***Phlyctaenia perlucidalis** Hb (5) HANTS S. Sparsholt College, 20.6, two, with one *P. xylostella* (AHD); HANTS N. Leckford, 24.6, (DHS); East Woodhay, 5.7 (R.J. Hornby per DHS); Burghclere, 5.7 (GGE-F). Thought to result from continuation of recent spread in south east England, though immigration is also possible.

Diasemiopsis ramburialis Dup. (2) CORNWALL W. Cusgarne, near Truro, 17.10, 27.10 (AS).

Hymenia recurvalis Fab. ESSEX S. Southend, 25.10 (D.Down per BS). Sub-tropical; most recent previous record is Durlston Head, Dorset, 8.10.1976 (P.H. Sterling).

Palpita unionalis Hb. (40) BERKS Fernham 20.9 male, 22.9 infertile female (SN). CORNWALL W. Penzance 7.11 (MPS). DEVON S. Abbotskerswell 15.10 (BPH). DORSET Studland 23.10, two (DCGB); Preston, 9.11 (M. Cade). ESSEX S. Bradwell-on-Sea, 9.10 (AJD), 19.10 (SD). HANTS ISLE OF WIGHT Freshwater 23.10 three, 12.11 (S.A. Knill-Jones, BENHS Exhibition). HANTS S. Sparsholt College, 19.10, 27.10 (R.A. Bell, per BS); Ringwood 24.10 male (Dr J. Clarke). HANTS N. Burghclere, 10.10 (GGE-F). KENT E. Whitstable 19.10 (E.S. Bradford); Folkestone Warren 25.10 (JMC-H & BS); Dungeness 25.10 (S. Clancy); 28.10 (S.M. Palmer). KENT W. Petts Wood 26.10 (D.O'Keeffe). SURREY Leigh, 9.11 (R. Fairclough). SUSSEX W. Walberton 9.9, 18.10, 26.10, 10.11 (JTR per CRP). SUSSEX E. Eastbourne, 23.10, seven males, one female; Ninfield 19.10, Holywell 25.10 (MP); Peacehaven,25.10 (CRP). WILTS S. Dinton, 28.10 (S.M. Palmer). GUERNSEY St Peter's, 13.11 (PDMC).'

Papilio machaon L. (3) ESSEX S. High Beach, 14.6, flying, very fresh (Paul Tout per CWP); Epping Forest, near Connaught Water, 5.7, flying (T.B. Bennett per Paul Tout, CWP). SURREY Elstead,25.5, in garden with one *C. cardui* (Fry per D.W. Baldock).

Lampides boeticus L. BERKS Reading, 25.8, found at rest and photographed by Prof W. van Emden (per BRB). [IRELAND: Several specimens reported to the Ulster Museum are known to have emerged in a laboratory (possibly from imported seeds). The species has not been found in the wild in Ireland (I. Rippey and RFH).]

***Nymphalis polychloros** L. SURREY Richmond Park, 8.7 (G. Simpson per CWP). The date agrees with the sightings of many *C. cardui* and *V. atalanta.*

Cyclophora puppillaria Hb. (6) DORSET Studland, 26.10, female (DCGB). HANTS ISLE OF WIGHT Freshwater, 25.10 (S.A. Knill-Jones). KENT W. East Malling, 20.10 (M. Easterbrook & D. Chambers). KENT E. Greatstone, 23.10 (S. Clancy). SUSSEX E. Rogate, 11.11 (JACG). GUERNSEY St Peter's, 18.10 (PDMC).

Rhodometra sacraria L. (c.95) BERKS Fernham, 5.9, 10.9, 21.9, 19.10 three, 21.10, 22.10 — eight in all (SN). BUCKS Weston Underwood, 16.9 (GEH). CHESHIRE Bromhall near Nantwich, mid September, flying in sunshine (P. Griffiths per C.I. Rutherford). CORNWALL ISLES OF SCILLY St Mary's, 20.9 (Malcolm Evans). CORNWALL W.Penzance 7.9, 16.9, red striped, 18.10, 19.10 three, 20.10, all brown striped; St Leven, by day 19.10 (MPS); Cusgarne, near Truro, 18.10, 20.10, 21.10 two, 24.10, 25.10, 26.10 three, 27.10 four, 28.10, 10.11 — fifteen in all, brown striped (AS). CORNWALL E. Sheviock, 10.9, two, one deep yellow, brown line, other paler, pinkish brown line (SCM). DEVON S. Ashburton, 9.9 (SCM); Abbotskerswell, 18.9, 20.10, 5.11 (BPH); Plympton, 19.10, 26.10 (R. Heckford). DORSET Portland, 24.7 two (J.E. Chaney); Portland B.O. 10.9, 11.9, 17.9, 28.10, 12.11, all singles (MR); Studland, 22.10, 23.10, 25.10, 26.10 three (DCGB); Preston, 26.10, female (M. Cade). ESSEX S. Bradwell-on-Sea, 1.9 female (AJD), 4.10 male (SD). HANTS ISLE OF WIGHT Freshwater, 21.10 (S.A. Knill-Jones, BENHS Exhibition). HANTS S. Highcliffe, 6.9 (EHW); Winchester, 7.9 (DHS). HANTS N. Northwood Park, Sparsholt, 23.10, 24.10, 25.10, males (R.A. Bell per BS); Burghclere, 26.10 (GGE-F). KENT E. Dungeness, 20.10, Greatstone 23.10 (SC). Hothfield, 28.8 (D. O'Keeffe). KENT W. Petts Wood, 21.8 two, 22.8 three, 29.8 (D. O'Keeffe). LANCS S. Hoghton, 28.8, female, ova: 29 moths emerged, "very mottled", 10-18.10 (J. Whiteside). SURREY Addington, 30.8 (B.S.) SUSSEX W. Walberton, 2.9, 21.10, 26.10, 27.10 (JTR per CRP); Littlehampton, 20.10 (R. Pratt per CRP); Rogate, 20.9, 22.10, 3.11 (JACG). SUSSEX E. Ninfield, 18.10 (MP per CRP). WILTS S. Dinton 14.10 (S.M. Palmer). CARDIGAN Clorack Bay, 9.9 (MDB). GLAMORGAN Rhossili, 9.9 (B.J. MacNulty, BENHS Exhibition).

PEMBROKE Lamphey, 27.10 (R. Elliott). CO. CORK E. Fota Wild Life Park, 18.10, eight (KGMB). GUERNSEY St Peter's, 15.9 (PDMC); St John, 29.10, 12.11 (R.A.).

Orthonama obstipata Fab. (63) BERKS Fernham, 20.10 (SN). CORNWALL ISLES OF SCILLY St Mary's, 20.10 (Malcolm Evans). CORNWALL W. Cusgarne, near Truro, 22.10, 23.10, 25.10 (AS). DORSET Portland,13.10, 23.10 fertile female (per NMH); Portland B.O. 25.10, 28.10 two (MR); Studland, 22.10 four, 23.10 four, 25.10, 26.10, 27.10 — 11 in all (DCGB). ESSEX S. Bradwell-on-Sea, 20.10 male, 29.10 (SD), 24.10 female (AJD). HANTS ISLE OF WIGHT Freshwater, 24.10 (S.A. Knill-Jones, BENHS Exhibition). HANTS S. Winchester, 17.10 (DHS); Highcliffe, 24.10 (EHW); Havant, 26.10 (J.W. Phillips). HANTS N. Northbrook Park, Sparsholt, 16.10 (R.A. Bell per BS). KENT E. Dungeness, 23.10; Greatstone, 23.10, three males, three females, 24.10 male, 27.10 female (SC). KENT W. Petts Wood, 8.5 (D. O'Keeffe). NORFOLK E. Winterton, 23.10 female (A. Foster). SURREY Bramley, 16.10 male (RFB). SUSSEX W. Walberton, 30.4, 22.10, 23.10, 24.10 two, 27.10 (JTR per CRP). SUSSEX E. Peacehaven, 19.10, 24.10, 25.10 (CRP); Ninfield, 26.10 (MP per CRP). YORKS S.E. v.c. 61 Spurn Point, 20.10 two (BRS). Muston, 22.10, two, 23.10 (P.Q. Winter). CO. CORK E. Fota Wild Life Park, 18.10 (KGMB). GUERNSEY St Peter's, 24.10 three, 27.10, 11.11 (PDMC); Le Chêne (TNDP per RA).

Thera cupressata Geyer (3) DORSET Studland, 22.10 two (DCGB). HANTS S. St Ives, 24.10 (Dr J. Clarke). Apparently there has been only one previous record of occurrence of *T. cupressata* in mainland Britain.

Acherontia atropos L. (two and one larva) SUSSEX E. Hope Gap, summer, found at rest on beach (D. Rushen ex "Living World" per CRP); Wilmington, early September, fully fed larva (P. Wooler per CRP); YORKS S.W. v.c. 63, Whiston, c.16.5, caught outside a vegetable shop ("Sheffield Star" per J.F. Burton).

Agrius convolvuli L. (15 and 2 larvae) BERKS Fernham, 22.10 (SN). CHESHIRE Hankelow, 4.9 (S. Young per C.I. Rutherford); Alderney Edge, 8.9, exhausted female (C.I. Rutherford). CORNWALL E. Crafthole, 18.9, larva on field bindweed (S.C. Madge). DORSET Portland B.O., 8.9, 17.9, (MR per NFM); Alderholt School, near Fordingbridge, caught early October (per AHD). ESSEX S. Bradwell-on-Sea, 22.8 male, 7.9 male (AJD), 14.9 male (SD). HANTS S. Havant, 24.8 (CBC). KENT E. Shadoxhurst, 25.8 (Mrs R. Edwards per DCGB); Greatstone, 18.10, fully grown larva (SC). YORKS S.E. v.c. 61 Spurn Point, 28.8, found dying, 20.10 (BRS). ORKNEY Cava Is., 9.8 (Miss Woodham & Miss Peckham, per RIL). FAIR ISLE B.O., 3.9. one found killed by cat. First record (per PMP). GUERNSEY St. Peter's, 16.10 (PDMC).

Eurois occulta L. MIDDLESEX Culford Road, London N.1, 30.7; *M. stellatarum* on same day (G. Simon per CWP).

Mythimna albipuncta D. & S. (6) CORNWALL E. Sheviock, 9.9 (S.C. Madge). DEVON S. Bigbury, 4.10 (M. Brigden). DORSET Portland B.O., 17.9 two (MR). HANTS ISLE OF WIGHT Freshwater, 25.8 (SAK-J, *Ent. Gaz.* **39**: 336) SUSSEX E. Peacehaven, 11.9 (CRP).

Mythimna vitellina Hb. (24) DORSET Studland, 15.10 (DCGB). ESSEX S. Bradwell-on-Sea, 17.9 (AJD). HANTS N. Sparsholt, 18.7, male, 15.10 male (R.A. Bell per BS). KENT E. Dungeness, 19.10 two, 23.10 three (SC); Greatstone, 9.9, 15.10, 21.10 (SC). SUSSEX W. Walberton, 16.10 (JTR per CRP). SUSSEX E. Brighton, 23.10 (R. Leverton). GUERNSEY St Peter's, 3.10 (GEH), 15.10, 16.10 two, 17.10 two,19.10, 20.10, 26.10, 27.10 (PDMC) — ten in all; Le Chêne, August, one (TNDP per RA).

***Mythimna l-album** L. (2) SUSSEX E. Peacehaven, 17.10 (CRP). KENT E. Dymchurch, 23.9 (John Owen).

Mythimna unipuncta Haw. (13) CORNWALL W. Penzance, 14.11, 17.11, 18.11 (MPS). DEVON S. Bigbury, 4.10 (MDB). DORSET Preston 26.10 (Martin Cade); Portland B.O., 10.11 (MR) ESSEX S. Bradwell-on-Sea, 10.10 (SD), 20.10 (AJD). SUSSEX W. Walberton, 19.10 (JTR per CRP). SUSSEX E. Peacehaven, 13.10, 17.10 (CRP); Brighton, 18.10 (R. Leverton per CRP); Ninfield, 19.10 (MP per CRP).

Mythimna loreyi Dup. (9) DORSET Portland B.O., 13.10, 28.10 two males, one female (MR). HANTS ISLE OF WIGHT Freshwater, 29.10, 8.11, 12.11 (SAK-J). KENT E. Greatstone, 23.10 male (SC). KENT W. Orpington, 26.10 (P. Sokoloff).

Polyphaenis sericata Esp. GUERNSEY Petit Bôt, 13.8 (R.A.)

Spodoptera exigua Hb. (c.180) BERKS Fernham, 18.8 two, 21.8, 1.9, 9.9, 25.10 (SN) — six in all; Uffington, 10.9 two (SN). DERBYS. Hayfield, 16.9 (I.F. Smith per RIL). DEVON S. Plympton, 20.9 (R. Heckford). DORSET Arne, 4.8 (G. Senior); Portland B.O. 5.8, 28.8, 4.9, 10.9, 14.9, 15.9 (MR) — Six in all; 10.9 three (SN); 20.9 (E.G. Smith); Studland, 22.10 three, 23.10 two, 24.10 four, 25.10, 26.10 three, 27.10 (DCGB) — 14 in all.ESSEX S. Bradwell-on-Sea, 23.8 two, 29.8 two, 1.9 two, 5.9, 6.9 three, 7.9 two, 9.9, 10.9, 11.9, 20.10, 21.10, 24.10 (SD) — 17 in all; 7.9, 8.9, 10.9, 11.9, 12.9, 26.10, 11.11 (AJD) — 7 in all. HANTS ISLE OF WIGHT Freshwater, 20.10 two (S.A. Knill-Jones, BENHS Exhibition). HANTS S. Brockenhurst, 23.7 (DCGB); Matley Bog, 4.8 two females (Dr J. Clarke); Ringwood, 5.9 (Dr J. Clarke); Highcliffe, 22.10 (EHW); Winchester, 23.10 (DHS); Swanwick, 22.9 (GEH); Lymington, 27.10 (A.S. Harmer). HANTS N. Sparsholt, 28.8, 6.9, 7.9, 23.10, 24.10 (R.A. Bell per BS). KENT E. Folkestone Warren, c.19.7 (A. Butcher per BS); 4.8 (BS); Sandwich Bay B.O., 23.7, 27.7 (I. Hunter per BS); Greatstone, 23.7, 27.7, 31.7, 3.8, 5.8, 10.9, 24.10; Dungeness 6.9 two 9.9, 10.9, 24.10 three (SC) — 14 in all; Stodmarsh, 1.8 (BS & R.G. Chatelain). KENT W. Dartford, 5.9 female (B.K. West). NORFOLK E. Norwich, 21.10 (A. Foster). SOMERSET N. Berrow, 8.9 (B. Slade). SURREY Leigh, 25.10, 27.10 (R. Fairclough). SUSSEX W. Walberton, 23.8, 2.9, 5.9, 8.9 four, 9.9 two, 18.10, 19.10, 24.10 — 12 in all (JTR per CRP). SUSSEX E. Eastbourne, 23.7 fertile female (CRP); Brighton, 23.7 (J.V. Banner per CRP); Friston Forest, 1.8 (CRP); Ninfield, 1.8 three, 2.8, 4.9 two, 6.9, 9.9, 18.10, 19.10 — 11 in all (MP per CRP); Peacehaven, 1.9, 4.9 two, 5.9, 6.9 four, 7.9, 9.9 six, 21.9 — 17 in all (CRP); Vann Common, 22.10 (S. Church). Eastbourne 23.10 (BS). WARWICKS. Charlecote,29.8 (DCGB). WORCESTERS. Blackwell, 22.10 (MDB). YORKS S.E. v.c. 61. Spurn Point, 20.10 (BRS). ARGYLL v.c. 97 Barcaldine near Oban, 8.9, 16.9, 17.9 (J.C.A. Craik). CO. CORK MID Fountainstown, 7.9, twenty-one, 8.9 two, 10.9 — 26 in all (AAM). CO. CORK E. Fota Wild Life Park,18.10 (KGMB). GUERNSEY St Peter's, 19.7, 27.8 two, 16.10, 20.10, 21.10, 24.10 — 8 in all (PDMC).

Heliothis armigera Hb. (78) CAMBS Alconbury, 19/20.10 (Dickerson, *Ent. Rec.* **101**: 86). CARMARTHEN Llwynhendy, 9.10 (I.K. Morgan). CARDIGAN Clorack Bay 9.10 (M. Brigden). CHESHIRE Alderley Edge, 8.9 (C.I. Rutherford); Cheadle Hulme, early September (B. Shaw per C.I. Rutherford); Bramhall, 11.9 (M. Passant per C.I. Rutherford). CORNWALL W. Penzance, 7.9, 23.10 (MPS); Cusgarne, 9.11 (AS). DERBYS. Hayfield,16.9, with *S. exigua* (I.F. Smith per RIL). DEVON S. Axminster, 17.10, 18.10, 21.10 (ECP-C). DORSET Studland, 22.10 two, 25.10, 26.10, 27.10 two — 6 in all (DCGB); Portland B.O., 28.10 (MR). ESSEX S. Bradwell-on-Sea, 12.5, 7.9, 16.10, 20.10, all males (AGD). HANTS ISLE OF WIGHT Freshwater 15.10, 23.10, 28.10, 12.11 (S.A. Knill-Jones, BENHS Exhibition). HANTS S. Romsey, 19.10 (D.F. Owen); Highcliffe, 21.9 three, 22.9 two, all sterile females (EHW); Lymington, 24.10 (A.J. Pickles, BENHS Exhibition); Havant, 26.10, 27.10 (J.W. Phillips); Winchester, 11.11 (DHS).

HANTS N. Sparsholt, 20.10 male and female, 22.10 male (R.A. Bell per BS). KENT E. Dungeness, 19.10 three, 24.10, Greatstone, 23.10, 27.10 (SC). LEICESTER. Leicester, 26.10 at garden m.v. light (D.F. Owen). NORFOLK E. Norwich, 20.10, Winterton dunes, 21.10 (A. Foster). SURREY Wimbledon, 23.10 (Sir John Dacie). SUSSEX W. Walberton, 15.10, 18.10, 19.10, 26.10, 9.11 (JTR per CRP); Littlehampton, 12.11 (R. Pratt per CRP). SUSSEX E. Ninfield, 16.10 four, 20.10, 22.10, 9.11, 10.11, (MP per CRP); Brighton, 22.10. two at ivy (R. Leverton per CRP); Peacehaven, 20.10, 9.11, 19.11 (CRP); Eastbourne, 23.10, male and fertile female (BS). WARWICKS. Charlecote, 9.11 (DCGB). GUERNSEY St Peter's, 16.10, 17.10, 18.10, 20.10, 21.10 (PDMC); Le Chêne, 20.10 (TNDP per RA).

Heliothis peltigera D. & S. (7 and 2 larvae) BERKS Fernham 10.9 infertile female (SN). DEVON S. Plympton, 26.10 (R. Heckford). KENT E. Faversham, 28.8, female at rest in a marsh (J. Platts); Dungeness, 6.9, larva on *Senecio viscosus* (SC). NORFOLK E. Overstrand, near Cromer, 25.7 (A. Cox per DCGB). SURREY North Cheam, 21.9 (R.F. McCormick). SUSSEX W. Pagham Harbour, 14.9, larva on *S. viscosus* (R.W. Phillips). SUSSEX E. Peacehaven,23.8 (CRP). WILTS S. Steeple Ashton, 8.9 (EC & MH Smith).

Eublemma parva Hb. (2) ESSEX S. Bradwell-on-Sea 21.9 (AGD). SUSSEX E. Peacehaven, 19.10 (CRP).

Chrysodeixis acuta Walker (3) HANTS ISLE OF WIGHT Freshwater, 19.10 (S.A. Knill-Jones, BENHS Exhibition). NORFOLK E. Winterton, 23.10 male (A. Foster, *ibid.*). SURREY Bramley, 10.11 (R.F Bretherton, *teste* BS *et. al.*).

Ctenoplusia limbirena Guen. (2) HANTS ISLE OF WIGHT Freshwater, 18.8 (SAK-J, *Ent. Gaz.* **39**: 336). BERKS Fernham, 7.9, in warm, clear S.W. air (SN).

Diachrysia orichalcea Fab. (2) HANTS N. Micheldever, 4.8 (B. Ivon-Jones per DHS). DEVON S. Bigbury, 4.10 (MDB).

Macdunnoughia confusa Steph. DORSET Wyke Regis, 22.9 (Paul Baker per NMH).

***Autographa bractea** D. & S. (3) LINCOLN N. Ancaster Valley, 31.7 in actinic trap (Paul Waring). NORFOLK W. Cranwich Heath, one male, one fertile female, 23.7 (R. McCormick). Possibly immigrants, otherwise further internal spread from north and Midlands.

Catocala fraxini L. MIDDLESEX South Tottenham, 19.8 (N. Bowman per C. Plant; identified by CP from a photograph).

Bibloporus minutus Raffray (Col.: Pselaphidae) in Surrey.

On 31.v.87 I obtained one specimen of this *Bibloporus* from under the bark of a leaning dead oak on Ham Common (TQ1871). Its identity was kindly confirmed for me by Professer J.A. Owen who permits me to record that he has found the species on Epsom Common in 1980 and on the White Downs in 1981. *Bibloporus minutus* does not appear to have been reported from Surrey before. (Also taken from the dead oak tree were a few *Sepedophilus bipunctatus* (Grav.) (Staphylinidae) and a dead *Phloiotrya vaudoueri* Muls. (Melandryidae).) — D.A. PRANCE, 209 Peregrine Road, Sunbury, Middlesex TW16 6JJ.

PRESS RELEASE

We have received the press release below from the Nature Conservancy Council. Because of the interest of the topic and the importance of the work, we reproduce the item in full:

RESCUE BID TO SAVE THE BRITISH RACE OF THE ESSEX EMERALD MOTH FROM EXTINCTION.

The British race of the Essex Emerald moth, *Thetidia smaragdaria*, is on the brink of extinction. In 1987 the known population fell to just eleven caterpillars but due to the success of the captive breeding programme mounted by the Nature Conservancy Council (NCC) the number currently stands at over one hundred. It is hoped that the adults which will emerge in July, will generate sufficient eggs and caterpillars for a return of this stock to the wild in 1990.

The Essex Emerald is a beautiful green and gold moth which was formerly widespread on the edges of the salt marshes of Essex and Kent, where it has been recorded by British entomologists since the 1820s. The British race is considered a distinct sub-species for two reasons. Using the colour and markings on the wings some experts can distinguish British specimens from those that occur in Europe. Also the British caterpillars are found only on sea wormwood, *Artemisia maritima*; in Europe they also occur away from the coast on other species of *Artemisia*, and on yarrow, *Achillea millefolium*, and other plants.

By 1978 only one colony of the Essex Emerald was known in Britain and a survey by NCC failed to find any others. Accordingly NCC entered into a management agreement with the owner of the site. In 1979 the moth was added to the list of species covered by the Conservation of Wild Creatures and Wild Plants Act, 1975. In 1981 the Essex Emerald was listed on schedule 5 of the Wildlife and Countryside Act. These measures make it illegal to collect or trade in the eggs, caterpillars, pupae or adults of this moth without a licence issued by NCC.

After 1978 the known colony was monitored annually by the Essex Naturalists Trust and NCC but it died out unexpectedly in 1985. Full scale surveys of the Essex and Kent coastlines were mounted in 1987 and 1988 but only one additional colony was discovered. This provided the basis for the captive stock. Since my appointment to NCC in 1987, as contract moth specialist, I have organised the captive rearing programme. I am also studying the Essex Emeralds that remain in the wild. The latest news is that there was a 75% disappearance of the wild caterpillars over the winter, leaving thirteen surviving.

The reasons for the decline in the number of colonies of the Essex Emerald moth are not completely clear. Traditionally climate and collectors have been blamed. There is ample evidence that large numbers of caterpillars have been collected from some localities in the past. It is

possible to collect up all the caterpillars from small sites. The recent work suggests however that the decline is more widespread than can be accounted for by collecting. The large scale changes to the saltmarsh zones caused by construction of sea walls must be considered. Sea walls enable conversion of saltmarsh into land suitable for agriculture or other development and result in a loss of habitat for the salt marsh flora and fauna. The sea wormwood and the Essex Emerald are particularly vulnerable in this respect because they are largely restricted to the edges and higher ground in saltmarshes i.e. the first habitat to be converted. Ironically the sea wormwood has subsequently colonised the old earthen sea walls and the Essex Emerald used to be found on these, in situations sheltered from wave action.

However the Essex Emerald has not been found on the modern "block-and-tar" and concrete sea walls that are subjected to scouring by waves, even though the caterpillars' food plant grows on them. Not only would the waves dislodge the caterpillars from the plant and sweep them away, such walls are often maintained by deliberately stripping away the vegetation on a regular basis, removing the foodplant totally.

The Essex Emerald is unlikely to be able to fly from one sheltered saltmarsh fragment to another when conditions become temporarily or permanently unsuitable and during the course of the twentieth century the number of colonies would have declined as a result. The captive-breeding and re-establishment programme will make it possible to move the Essex Emerald back into some of the surviving saltmarsh fragments, some of which are nature reserves, and will provide a test of whether these areas really are suitable today. — Mr PAUL WARING, Moth Specialist, Terrestrial Invertebrate Branch, Nature Conservancy Council, Northminster House, Peterborough PE1 1UA. June 1989

Hazards of butterfly collecting — Lebanon 1973

A MAN has got to do what a man has got to do. I think it was John Wayne who said this in some film. On the whole it is probably bad advice.

In spring of 1973 there was a sort of "pre-testing" of the Lebanese civil war, initiated by Suleiman Frangieh, one of the more bizarre political leaders since Caligula. The Lebanese army was entrenched in fixed positions, glowering at rather less organised Palestinian encampments. Everyone else was busy creating their own militias. This is the sort of situation which makes for "sub-optimal entomological field conditions" as some of my American colleagues would put it. However, sub-optimal or not, I simply had to go to one of the worst zones of conflict. Late the previous year I had caught a single male of a blue butterfly that was almost certainly new to science at Nabi Sbaat in the Antilebanon mountain range. To be certain I needed more specimens, and most of all I needed to cryo-freeze living males so that the chromosome numbers could be established.

It had to be in late May or early June, because there is only one brood. So off I went . . . a man has got to do . . .

Just off the main Baalbeck road I ran into an army picket straddling the approach to the Antilebanon mountains. It had not been there last year. They had fired off an impressive amount of artillery shells these last few months. A French speaking lieutenant appeared. I wanted to collect butterflies. He thought I was mad on two counts. The mountains were full of Palestinians, and what use were butterflies anyway. But it is (was) a free country. He shrugged his shoulders; I do not think he expected to see me again.

Well, I had no personal quarrel with the Palestinians and could have told the lieutenant a lot about the uses of butterflies, so I proceeded. I told him to call my wife if I was not back before dusk. I reached my spot. The platoon of guerillas and their wicked looking 12.7mm machine gun had not been there last year. My papers were checked. No Israeli visas. Lots of visas from Arab countries. No incriminating things like maps. Photos were admired. That of my wife passed enthusiastic muster; she still has a standing invitation to swim on the beaches of Acre when Palestine is liberated. One of the guerillas insisted that I should be called "Charlie". He had been a deck hand on an American ship and liked the name. Eventually I was allowed to descend the wadi to collect. There would be no problem. Half an hour later I was back, a Kalashnikov gun in my ribs, held by a gleeful gentleman who was certain that great advancement would now come his way. "Sorry about that, Charlie!" said my friends back at the 12.7. This procedure was repeated five times. By then I had actually stopped being scared!

On each of the trips, before meeting the guy with the gun, I did catch a few of the butterflies. It was new to science. I named it after Dr. Samir Deeb who helped me with the chromosome counts. Perhaps *Agrodiaetus kalashnikovi* would have been a more appropriate name. For more that ten years my type series of *Agrodiaetus deebi* remained the only ones known, but I have been pleased to learn that recently large numbers have been found in the Syrian parts of the Antilebanon. — TORBEN B. LARSEN, 358 Coldharbour Lane, London SW9 8PL.

Uncommon Heteromera (Col.) from a S.E. London wood.

The following were met with, mostly last summer, in the woods at Shooters Hill (Oxleas Wood SSSI). Farther out from the metropolis, in almost any piece of old wood- or park-land, their occurrence would be unsurprising, though none are common; but in the circumstances, I feel they are worth at least a passing notice. Single specimens are to be understood in each case.

Tetratoma fungorum F.: an elytron under bark of a fallen dead oak branch. A species found in the adult state from late autumn to spring (seldom later), scarce in this district though possibly general. *Orchesia undulata* Kr.: among small polypori on piece of dead oak bough, 27.vii.88; under loose bark of section of oak log, same date. Usually somewhat gregarious, but evidently very rare here. *Phloiotrya vaudoueri* Muls.: a small female at the former site on the oak bough, 27.vii.78. (Has occurred fairly lately in the N. London areas at Chiswick Park and Hampstead Heath.) *Conopalpus testaceus* Ol.: female swept under oak, 1.viii.88; male by general sweeping, 12.vi.89. *Lissodema quadripustulata* Marsh.: brushed from foliage of straggly young trees, 13.vii.88. *Mordellistena variegata* F.: off oak on western fringe of the woods, 13.vii.86; shaken from umbel of hogweed, 18.vii.88. *M. humeralis* L.: swept from mixed herbage, 5.viii.86. *M. neuwaldeggiana* Panz.: male on hogweed umbel, 13.vii.88; the first I have found in the district. (*M. parvuloides* Erm. and *M. acuticollis* Schil.: see *Ent. Rec.* **98**: 49 (1986); this gives me the opportunity to say that, despite persistent efforts, neither has turned up again since the captures there recorded.) The genus *Mordellistena* is thus remarkably well represented, with two species not otherwise known from Britain, in this locality where, in spite of favourable-looking conditions, the fauna in many groups appears to be strangely deficient. — A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

2nd International Entomological Trade Fair.

We have just received notice that this fair will be held on 25th and 26th November 1989 at the Mairie of Paris, 14th District, Mouton Duvernat Street, Paris, France. Further details from the Editor, or direct from Bernard Courtin, France Entomologie, 18 Sente des Chataigniers, F. 92380 Garches, France. The society France Entomologie has just published a list of names, addresses, telephone numbers of all French societies, museums, dealers and butterfly farms. Price 10 US dollars.

Local lists of Lepidoptera or a bibliographical catalogue of local lists and regional accounts of the butterflies and moths of the British Isles

by **J.M. Chalmers-Hunt**. 247pp. Boards. Hedera Press/E.W. Classey, 1989. £21.00. ISBN 0 86096 023 4.

I have often felt that the human species must possess a gene that confers upon its owner the compulsion to make a list. If so, this gene must occur with a high frequency in entomologists, who have made lists of species ever since the first struggling "worm" was impaled upon a pin by one of our entomological forefathers.

Whatever the nature of the list, be it a carefully researched catalogue of local fauna, a list of holiday captures, or a compilation of species

containing material which one of our contributors is wont to describe as "largely fiction", (usually in relation to larval foodplants), the local list is perhaps one of our most fundamental databases for investigating the distribution and ecology of our native lepidoptera. "Where does the species occur?" and "Has it been taken here before?" are questions frequently posed by entomologists. All too often the answers to those questions are buried in an obscure *Transactions of*. . ., or a long-forgotten slip of a publication. It is against this background that our gene reaches its finest expression — the list of lists.

The work under review cites over 3000 titles covering county and regional lists and local accounts of British Isles' lepidoptera (including the Republic of Ireland), although lists with only a few species are omitted. The style of presentation is very similar to that of R.B. Freeman's *British natural history books 1495-1900, a handlist.* A short list of bibliographical references precedes a brief introduction to the work. The body of the text comprises a numbered list of references arranged in alphabetic order, by author. There are 3161 references, although some of the serial numbers have been omitted. Each entry details the author's name, date of publication, title, pagination (where the item is a free-standing publication) or reference (where citing a serial publication). The county to which the list refers is given in parenthesis. Annotations and details of current location are given for items of particular interest such as those of extreme scarcity, manuscript or annotated lists. The work concludes with a list of the counties of England, Scotland, Wales and Ireland cross-referenced to the entries in main text. Thus a reader with an interest in Cornwall can see at a glance that there are 77 cited references, and where these occur in the text.

The major frustration in reading through this book was a lack of information about the content of each item — did it include micros? was it butterflies only? were questions the reviewer often asked, and many (pleasant!) hours were spent delving into the library shelves to chase up interesting items. This criticism is, in many ways, unfair as this level of detail would be immensely time-consuming to research and would have increased the volume (and price) of this work many fold.

A more practical criticism reflects a more general problem in recording — what geographical unit should be used? The author has chosen a middle course of approximately Watsonian counties. This may be sensible in terms of continuity of recording units, but without explanation, risks confusing the younger and future reader who may never have come across the counties of Westmorland or Merioneth.

Despite these comments, this book is an invaluable resource for lepidopterists, and a tribute to the author, himself a grand-master in the art of compiling local lists. The book is published by E.W. Classey under the imprint "Hedera Press" in tribute to the late Ivy Classey.

Paul Sokoloff.

OBITUARY

Alexander Barrett Klots

It is with regret that we record the death of Alexander Klots on 18th April 1989, at the age of 85. Born in Manhattan, he was a graduate of the Trinity School, Blair Academy and Cornell University from whence he received Bachelor's, Master's and Doctoral degrees.

From 1934 to 1965 he was professor of biology at City College, and later a research associate of the American Museum of Natural History. He was past president of the New York Entomological Society and of the International Lepidopterists Society as well as being a Fellow of the Royal Entomological Society and the Linnean Society.

Klots was a leading authority on Lepidoptera, and a prolific writer. Apart from many papers, he was author of two books, *The world of butterflies and moths*, and the best-selling *A field guide to the butterflies*, which he published in 1951. he was co-author, with his wife Dr Elsie Klots, of a further four books on entomology. Paul Sokoloff.

Stanley Jacobs writes . . . "my friendship with Alexander Klots began in the early 1930s when Dr E.A. Cockayne asked if anyone would care to open a correspondence with an A.B. Klots, a promising young American Lepidopterist. We met at the British Museum (Natural History) on the occasion of his visits to check on type material, and arranged to exchange periodical subscriptions and specimens, an arrangement which lasted until his death. On several of his visits he was accompanied by his wife, Dr Elsie Klots, and we managed to squeeze in occasional collecting trips in the southern counties.

During the Second World War he served with the United States Air Force and one of his tasks was to ensure that transport aircraft were free of *Anopheles* mosquitoes. During these war years we received from him and Elsie many most acceptable food parcels, a kindness which, unfortunately, we were unable to return adequately. During 1977 and 1981 I was able to spend some time at his delightful home in Putnam, Connecticut which, as might be expected, was ideally fitted for collecting.

For many years before his retirement he was a leading lepidopterist at the New York Natural History Museum, where his last *magnum opus* was to have been a work on the Crambinae. This collided with a similar project started by E. Bleszynski, but they agreed to share the work with Klots dealing with western material and Bleszynski the eastern. Unfortunately, Bleszynski died in a motor accident and Klots, having almost completed his part of the work fell victim to emphysema and was unable to finish the task. His uncompleted manuscript will, I am sure, have found its way to the museum to await completion by another lepidopterist.

Personally, I will never forget such a good friend and pass on my sympathy to Dr Elsie Klots, their daughter Louise and son Cornelius."

TO OUR CONTRIBUTORS

ALL MATERIAL FOR THE TEXT of the magazine as well as books for review must be sent to the EDITOR at 4 Steep Close, Orpington, Kent BR6 6DS.

ADVERTISEMENTS, EXCHANGES and WANTS to P.J. JOHNSON, B.A., A.C.A., F.R.E.S., 31 Oakdene Road, Brockham, Betchworth, Surrey RH3 7JV. Specimen copies will be supplied on payment of £1.20 Sterling.

CHANGES OF ADDRESS to C. PENNEY, F.R.E.S., 109 Waveney Drive, Chelmsford, Essex CM1 5QA.

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Many ILLUSTRATIONS can be inserted in the text at no extra cost. However, full page plates can only be inserted on condition that the AUTHOR DEFRAYS THE COST.

Contributors are requested not to send us Notes or Articles which they are sending to other magazines.

All reasonable care is taken of MSS, photographs, drawings, maps, etc, but the Editor and his staff cannot hold themselves responsible for any loss or damage.

Readers are respectfully advised that the publication of material in this journal does not imply that the views and opinions expressed therein are shared by the Editor and publisher.

THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

(Founded by J.W. TUTT on 15th April 1890)

Contents

Notes and observations

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EDITORIAL

AS WE approach our centenary year, it is worth recalling the words of the *Record*'s founder, J.W. Tutt, in his preface to volume 1: *"It has been our aim to make the Magazine as popular as possible, consistently with no decrease in its scientific value"*. That philosophy is still as important today as it was 100 years ago. To achieve that aim there are two simple requirements: a steady flow of contributions, be they notes or papers, formal or informal; and a sufficient number of subscribers to make the enterprise financially viable.

We have had a reasonable number of contributions in recent months and, provided this continues, we should be able to present a varied and interesting selection of material in 1990.

Thanks to efficient management by our Treasurer, and the fact that all those who help the *Record* give their time voluntarily, we have been able to hold the subscription at the same rate for another year. The subscription 100 years ago was six shillings, with an additional one shilling for those who wished to have the index as well. How this compares with today, given inflation and the rise in incomes, is beyond the Editor's ability to calculate, but must surely still be good value.

Help wanted

In order to survive for another hundred years, we need to attract more subscribers. We hope that any reader who finds the *Record* of interest, will recommend a subscription to a friend. We would also like to consider new ways of widening the readership, perhaps by selective mail shots or more effective advertising, and to that end the *Record* would welcome the help of someone skilled in marketing or publicity to advise us on the way forward, and perhaps run a short campaign next year. If you feel you have the right skills and would be prepared to help, please contact the Editor.

S.N.A. JACOBS

1896 - 1989

It is with great sadness that we report the death of Stanley Jacobs on 14th September 1989, at the age of 92. A well known entomologist and entomological illustrator, he edited the *Record* for 17 years between 1955 and 1972. A full obituary will be published in the next issue.

Has *Abraxas grossulariata* L. (Lep.: Geometridae) been shifting its seasonal cycle?

I have in the past always regarded the Magpie moth as a July and August insect; in my early memories it is indelibly associated with summer holidays, and that means August. In this impression I find I am supported by the several authorities at my disposal, all of whom give the above two months for the appearance of the species in the perfect state — only Barrett (1901) adding "end of June". That being so, odd June examples now and then should occasion little surprise; but my experience such as it is seems to point to some more substantial and (now, at least in my district) habitual deviation from the accepted norm.

In fact I can positively assert that here, since my move from Blackheath to Charlton late in 1973, *grossulariata* has become a June insect. It is, I think, much less of a garden pest nowadays than formerly, and up to the later 1970s I had for many years met with only singletons from time to time, either at light or in nocturnal flight — almost always in July. Around that period, however, and at intervals up to six or seven years ago, it occurred very freely indeed in certain seasons on and about hedges of *Euonymus japonicus* in this neighbourhood (a well-known foodplant, of course) — but from early in June, after which month hardly a specimen would be seen. And (as if to continue this marked shift from the second to the first half of summer) all records were broken, as far as I was concerned, when a Magpie moth this year presented itself at my m.v. lamp on the night of the 24th May! It might be suggested that the high day temperatures prevailing during that month had forced an early emergence, but, as against that, no such advance on usual dates was noted among its fellow moths at the lamp; indeed, these actually included two March and April species (*Orthosia gothica* L. and *Xylocampa areola* Esp.). So I am left wondering!

If a marked trend over the years to an earlier period of adult activity is as genuine as it appears, and not just a temporary or local phenomenon, it certainly is surprising that, in the case of such a common and familiar moth, it does not seem well known. At all events, I have seen no reference to it. Assuming it *is* a fact, one would expect parallel instances among our moths, to say nothing of other insects; for a gradual climatic change (if that is its cause) must affect all and sundry. Has any reader noticed this tendency, in either *grossulariata* or any other species — or, for that matter, the opposite one of a move from an earlier to a later imaginal period? — A. A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

Clouded Yellow butterfly in Warwickshire

In view of its apparent scarcity so far this year, it is worthwhile reporting a sighting of *Colius croceus* Geoff. at Alvecote Pools, North Warwickshire on 1st August 1989. — B.R. MITCHELL, 127 Watling Street, Grendon, Atherstone, Warwickshire.

MOTHMANSHIP (HOW TO BE ONE-UP AMONGST LEPIDOPTERISTS) PART II: PLOYS WITH LIGHT

E. H. WILD

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IN this section I give two examples of Master Ploys which I was fortunate enough to witness, each dealing with special problems that may be encountered while collecting.

When on field meetings, it can happen that we may be plagued by the unscrupulous collector, the type who turns up armed with a bicycle lamp and a very large killing bottle, and armoured with the hide of an elephant, visits each member's sheet in turn, to plunder and parasitise to the dismay of all. Fortunately they are a rare species, but when one appears he causes considerable ill feeling.

The Leader, who was warden of a small wetland reserve, displayed his talents as a Lifesman in a ploy which has since become known as H's Helping Hand. He placed his sheet and generator at the disposal of the unwelcome guest, settled him on a small island in the middle of a dense reed bed, which required specialist knowledge of access to avoid submergence, and ran a long black cable back to the generator on the path. The rest of us set up our lights well away from the spot, hopeful of a pleasant evening . . . Soon after dark, how or why, "Whisper it not in Gath", the Leader's genny stopped.

It was a cool night with little flying, so the rest of us had gathered round one lamp to socialise. We became aware of strange sounds among the reeds. One hopeful young member thought it might just be a bittern visiting Kent. This was doubted though we did agree the "Island was full of strange noises." Interested speculation whiled away the long hours between moths while "On the mere the wailing did *not* die away." Eventually a fine rescue was effected in the small hours. So great was the general sympathy that the victim was stunned by the unaccustomed popularity.

The second case was a very different affair and is now known as "The Blessed Bernard's Benediction." I was visiting that well-known spot "The Triangle" with this paragon of Lepidopterists and we had set up lights outside the bounds of the Reserve. I had a light on the "Triangle" and we sat there in pious meditation. Suddenly, along the track came a young lady on a moped, helmed like a Valkyrie, who pulled up and in no uncertain terms told us that we had no right to be there. She was herself on the staff of the reserve and had authority to move us on. I would have pointed out that we were doing nothing illegal, but that was not the Blessed Bernard's way. He sat down cross-legged at her feet and gazed up at her in awe and wonder, as one in the presence of Gamaliel. The more she ranted and raved, the more benevolent and interested he became, and the deeper his

silence. Only when she had talked herself to a hoarse whisper did she remount and, uttering strangled threats, drive off in the direction of the reserve. It was only as her rear light vanished into the night that the Blessed Sage uttered his first words in a quiet sad voice. They were short and pithy and far too esoteric to be printed in such a secular Journal as this. Little did the young lady realise she was entertaining a Saint unawares.

In the matter of lights themselves there is, or has developed, a scope for one-up-manship. Starting with a humble torch searching flower heads, or climbing the old square-framed gas lamps, collecting was a slow and laborious game. Graduating to a Tilley could give better things at a place like Wicken or Tilgate. Then the Robinson Revolution burst upon us and things were never the same. The wealthy among us like Demuth or Richardson turned up towing massive generators and we were humbled.

Then, working as a team, the late John Newton picked up an old Jap engine mounted on a carrying frame. I collected a huge metal cased marine rotary converter and Dr Ellis built another case with choke and electricals. Mounted in series with a perforated oil drum as a baffle over the exhaust the set-up was most impressive and it worked most of the time.

Today the top lights-men must have two or three Hondas and run at least six lights. Or they may go in for quality like Mr Dewick with his gigantic trap — surely he must qualify as Top Lights-man.

And yet — I remember visiting that charming man Dr Blair in his study with the two carefully constructed towers of struck matches on the leather-topped table and the window overlooking Freshwater Marsh. Surely he is the only man to have put three species new to the U.K. on the map in so short a time. Of course, if you do your collecting in hothouse fisheries, you takes your choice.

Reference

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Pieris rapae (L.) ab. *minor* (Lep.: Pieridae) in Wiltshire.

A male of the dwarf form (ab. *minor*) of *Pieris rapae* (L.) was taken on Cherhill Downs, Wiltshire (SU 05 70) 7th August 1975.

The specimen has a wing span of only 33mm. These dwarfs appear to be very scarce as there are only eight specimens in the Rothschild-Cockayne-Kettlewell Collection in the British Museum (Natural History), London, mostly from southern England with dates ranging from May -August, 1901-1935. The form is not mentioned by de Worms in *The Macrolepidoptera of Wiltshire* (1962). — KENNETH G.V. SMITH, 70 Hollickwood Avenue, London N12 0LT.

THE GENERA *RHAGIUM* F. AND *STENOCORUS* MÜLL. (COL.: CERAMBYCIDAE) IN THE BRITISH ISLES

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Introduction

OF THE three species of *Rhagium* found in our islands, two, *Rhagium bifasciatum* F. and *R. mordax* Degeer, are widespread; the third, *R. inquisitor* L., is basically a Scottish species, imported specimens of which turn up in a variety of localities where softwoods are in demand. *Stenocorus,* on the other hand, has not been recorded with any certainty north of Cumberland and Durham.

The adults of *Rhagium* all eclode during the late summer and autumn; however, they remain passive just under the bark of their host trees, emerging in the following spring.

Balfour-Browne (1931) symbols are used for county and vice-county names: italicised letters signify a commonly recorded beetle; those that are bracketed represent doubtful entries needing confirmation. (See also Kaufmann, 1989.)

Rhagium bifasciatum F.

The distributional data below complements the account of this species (Kaufmann, 1988).

ENGLAND: *BD* BK BX CB *CH CU* DM *DT* DY EC *EK EN ES EX* EY G E
GW HF HT IW L LN *LR* MM *MY ND* NE NH *NM* NN NO NS NW NY OX *SD SE SH* SL SN SP *SR* SS *ST* SW SY *WC WK* WL WO *WW*

WALES: BR CD CM CR DB FT GM MN PB RA

SCOTLAND: AM *AS* AY B BW DF *ED EI* EL FF HD KB KF LA LL PB *PC* PM PN RE RF RW S SG SK SS WI WT

IRELAND: AN AR (CL) CV (CW) DO DU ED FE KC LD LE (LH) LK NG NK NT QC SG SK SL ST TY WA WC WG WH WI WM WX

R. bifasciatum F. varieties

v. *infasciatum* Pic	SCOTLAND: EI
v. *blairi* Kaufm.	ENGLAND: CH
v. *bistrinotatum* Pic	ENGLAND: CH ML
v. *unifasciatum* Muls.	WALES: CD
v. *deyrollei* Pic	ENGLAND: No other data; *in coll.* Manchester Museum
v. *latefasciatum* Pic	ENGLAND: CH SH SR WY SCOTLAND: PM
v. *dentatofasciatum* Kaufm.	ENGLAND: BK CH SR

v. *lituratum* Fügn.	ENGLAND: CH SR
v. *mediofasciatum* Pic	ENGLAND: ML ND WL
v. *gravei* Hubenth.	ENGLAND: ML SH SR ST
v. *connexum* Everts	ENGLAND: BK SH SR ST WO
v. *nigrolineatum* Donovan	ENGLAND: CH HT IW SH SL SR ST WY
v. *ornatum* F.	ENGLAND: CH EK EY SH SL SR ST
v. *quentini* Kaufm.	ENGLAND: SR
v. *bimaculatum* Marsh.	ENGLAND: J.F. Stephens' colln. BM(NH)
v. *simoni* Pic	ENGLAND: CH MY SD SH SR WO WW
v. *virgatum* Kaufm.	ENGLAND: CH SH
v. *ictericum* Schleicher	ENGLAND: ML SH SR WY SCOTLAND: EI PM

Fig. 1. The Irish distribution of *Rhagium bifasciatum* F.
(Shaded areas = unspecified localities). For Distribution Map of Mainland Britain see Kaufmann (1988). *Ent. Rec.* **100**: 217-225.

R. mordax Degeer

A well-distributed species throughout the British Isles whose imagines are found mainly in wooded regions, particularly where there are plenty of dead oaks, a favoured growth, but by no means restricted to broad-leaved trees, occurring as well with conifers.

ENGLAND: *BD* BK BX CB *CH CU DM DT* DY EC EK EN ES *EX EY* GE GW HF *HT* HU IW L *LN LR* MM MX *MY ND* NE NH NM *NO*

NS NW NY OX *SD SE SL* SN SP *SR* SS ST SW WC *WK* WL *WO* WW WX *WY*

WALES: BR CD CR DB FT GM MG MN PB RA

SCOTLAND: AM AS AY B BW CA CT DF *EI* EL HD KB LA M PE *PM* PN RE RW SG WI

IRELAND: AN CV DO ED FE KC LD NG NK NT QC RO SG SK (SL) (TY) WC WH WL WM

The amphixylophagous larval life is normally of two years' duration but may extend to a third year in the more mountainous parts of the country. It prefers decaying, soggy felled timber whose bark is still intact; it also feeds in, helping to break down, the rotting boles, branches and roots of alder, ash, beech, birch, buckthorn, common silver fir, crabapple, elm, hawthorn, holly, hornbeam, horsechestnut, larch, lime, maple,oak, *Pyrus acuparia, P. malus,* rowan, Scots pine, service tree, spruce, sweet chestnut, sycamore, walnut and willow, in which respect, as is the larva of *R. bifasciatum* F., it is beneficial to forestry, although it is sometimes found in still sound trees.

The following Hymenopterous Ichneumonids and Braconids parasitise the very active larvae:— *Coelobracon denigrator* L., *Ephialtes tuberculatus* Fourcr., *Ischnocerus caligatus* Grav., *I. rusticus* Fourcr. and *Xorides filiformis* Grav.

Pupation occurs from July onwards and the beetle emerges about a month later, but, as has been remarked, it does not bore through the bark until at the earliest March of the next year; thereafter the imagines are found throughout the warm months when they may be beaten off or swept from blackthorn, brambles, elder, guelder rose, hawthorn, *Spiraea, Umbelliferae* and wild rose. Where oak felling particularly is in progress, it is also found hiding under the pieces of discarded bark and among the chippings. The quiescent perfect insect may, of course,be found during the autumn and winter months simply by removing the loose bark from decaying tree stumps.

The elytral pubescence is subject to variation; some eight different forms are described from abroad; only one, the v. *morvandicum* Pic, in which the yellow pubescent bands do not meet at the suture, is likely to be found with us.

R. inquisitor L.

One of a very short list of exclusively Scottish Cerambycids which has been exported in pit props, telegraph poles, logs and cut timber from Scotland, and also present in softwoods imported from Canada, the United States and elsewhere. English, Welsh and Irish records are of fortuitous examples.

It has been reported as occurring *en nature* in the New Forest area: evidence that it is established there is unconvincing.

SCOTLAND: AM AS BF BW CT DF *EI* EL KF KI AA M NS *PM* RE RW S G
SK SS WI

Adventive records, mainly from sawmills, timber yards, mines and builders' stockpiles are:—

ENGLAND: (DT) DY EK (EN) EY (SE) SH (SP) ST SW WY
WALES: GM
IRELAND: ME NG WI

The duration of the instar stages is variable; in suitable conditions it can be as short as one year; in less favourable circumstances the larva may take three years to mature. It is found principally in moist rotten trees and stumps which have retained their bark. With a predilection for coniferous growths, it does attack standing trees which are less impaired than those preferred by our other two species of *Rhagium*; this accounts for those imagines which turn up by accident on industrial sites where apparently outwardly good timber is stacked. The larval pabulum includes Algerian fir, Atlas cedar, birch (only occasionally as the paper thin bark does not provide much protection during the winter months after eclosion), fir, larch, oak, Scots pine especially and spruce.

The larva is parasitised by a long list of Hymenopterous Ichneumonidae and Braconidae; these are:— *Bracon simplex* Creeson, *Coelobracon denigrator* L., *C. initiator* N., *Coeloïdes initiator* F., *Deutoxorides collaris* Gr., *Dorytes leucogaster* Nees, *Echthrus reluctator* L., *Ephialtes abbreviatus* Thoms., *E. dux* Tschek, *E. terebrans* Ratz., *E. tuberculatus* Fourc., *Ipobracon nigrator* Zett., *Ischnocerus seticornis* Kr., *Sichelia filiformis* Grav., *Xorides irrigator* F. and *Xylonomus rufipes* Grav.

The Coleopterous larva of the Staphylinid *Nudobius lentus* Er. is a predator of the immature stages of *R. inquisitor*; other natural enemies include woodpeckers and ants, the latter foraging for both eggs and young larvae.

Pupation takes place during the summer and autumn; occasionally, late pupae will overwinter. The adult insect emerges after a month or so but it remains inactive just under the bark, appearing in the open during April. All three stages, larva, pupa and imago, are often present in the same tree.

R. inquisitor is a localised beetle which is becoming scarcer. It may be taken from rotted timber or captured until August by beating the dead branches of conifers. It is also attracted to umbels growing in the vicinity of forest lands. There is a Scottish record from jessamine.

Stenocorus meridianus L.

One of our large more handsome Cerambycids, prone to considerable variation; the sexes are dimorphous, ranging from silky black through

testaceous to rufous coloration. It is generally distributed south of the Border, albeit local and no longer common. Welsh records are sparse; there is none from Ireland. It is unknown in Scotland, where it might be expected to occur, since it is found in Norway and Sweden. Largely captured in deciduous forest areas and along the flowering edges of woodlands.

ENGLAND: *BD BK BX CB CH* CU DM *DT* DY (EC) *EK* EN *ES* EX *EY GE* GW HF *HT HU IW* L *LN LR* LS MM MX *MY ND* NE NH *NM NO* NS NW NY OX *SD SE SH* SL (SN) (SP) *SR* SS *ST* SW (WC) *WK* WL *WO* WS *WW WX WY*

WALES: BR DB GM

Rather surprisingly for so conspicuous a beetle, accounts of the metamorphosis of *S. meridianus* in this country remained equivocal until the early 1950s; Stephens (1831, 1839) and others stated that the beetle was particularly associated with ash trees, and Fowler (1890) recorded it from deciduous stumps; Kaufmann (1947) published a correspondent's note that it had been captured emerging from its bolt holes in pine posts; in general, however, there is little else to be gleaned from our literature beyond its floricolous associations.

In 1953 Duffy gave a first-hand account of the ecology of this beetle, including a most interesting controlled experiment which he had conducted with some gravid females. In an enclosed cage he placed stumps of alder, beech, birch, black poplar, crabapple, oak and pine. In due course eggs were laid in all these samples, the poplar stump being particularly well-received. Some of these eggs hatched after a fortnight and a number were successfully reared to adulthood, the life cycle taking two years to complete.

In the wild the larva is found in the brittle or rotting trunks, stumps, branches and thinner roots of the following:— alder, ash, elder, beech, birch, crabapple, hazel, hornbeam, oak, pine, poplar, sour cherry (and other wild fruit trees), whitebeam and willow. When fully grown the larva leaves its host tree and excavates a pupal cell some 10 cm deep below in the soil. Eclosion follows from April until June.

The beetle is found until August — there is exceptionally one November record — notably in hot weather, by beating or sweeping alder, apple blossom, ash, aspen, blackthorn, brambles, buckthorn, cow parsley, dogwood, elder, elm, hawthorn, hazel, hogweed (to which it has been observed approaching by Dr Hickin, its long legs trailing, circling and hovering before settling, somewhat reminiscent of a helicopter's descent on to a landing pad), oak, pine, poplar, *Spiraea, Viburnum,* wild rose, withies and yarrow.

In flight *S. meridianus* produces quite a noisy whirring sound. The females are larger and bulkier and thus identifiable from the slimmer males with their longer antennae.

S. meridianus has eight varietal forms, six of which occur with us: two varieties, v. *rufiventris* Marsh. and v. *chrysogaster* Schrank, are named in our earlier catalogues (Stephens, 1829; Curtis, 1837; Waterhouse, 1858); others are illustrated by Martyn (1792), Fowler (1890) and Linssen (1959).

v. *chrysogaster* Schrank	ENGLAND: BK CB DT HT HU IW LN NS OX SD SE SH SR WK WO WW
	WALES: CR FT GM
v. *bilineatus* Pic	ENGLAND: LN LR NH WK
v. *laevis* Oliv.	ENGLAND: LR WO
v. *cantharinus* Herbst	ENGLAND: BK GE IW LN LR MX NO NS SR WO WW
v. *rufiventris* Marsh.	ENGLAND: ES LN MY NS SD WK
	WALES: CR
v. *ruficrus* Scop.	ENGLAND: NS

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Callophrys rubi L., the Green Hairstreak (Lep.: Lycaenidae) — an additional foodplant.

A wide acceptance of foodplants, from several botanically distinct families, is recorded for this species. I believe I can add another to its English diet.

On 11th June 1989 I observed several individuals of this species in two separate localities in Sutton Park, West Midlands, laying on cranberry (*Vaccinium oxycoccus* L.), a foodplant not cited in Emmet (1989, *The moths and butterflies of Great Britain and Ireland* **7**: 121). The usual foodplant in this type of locality is probably bilberry (*Vaccinium myrtillus*) and this species, together with cowberry (*V. vitis-idaea*) was present in much greater quantity, but the insects ignored them, clearly preferring their near relative. — J.R. ROBERTS, 17 Woodcote Road, Leamington Spa, Warwickshire CV32 6PZ.

Dendrolimus pini L., the Pine-tree Lappet (Lep.: Lasiocampidae) in Guernsey.

On the night of 9/10 July 1989, in still and overcast weather, I was surprised and delighted to find a specimen of *Dendrolimus pini* L. attracted to m.v. No other migrant species were seen that night.

The species was added to the British list on the basis of a specimen taken in Norwich in 1809 (Barrett, C.G., 1896. *The Lepidoptera of the British Isles*, **3**), but as far as I am aware there have been no further confirmed records. The species is widespread in Europe and the larva can be a pest of pine and spruce. — T.D.N. PEET, Le Chêne, Forest, Guernsey, C.I.

NOTES OF LAMPRONIA FUSCATELLA (TENG.) (LEP.: INCURVARIIDAE)

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THE status of *Lampronia fuscatella* (Tengström, 1848) in Britain was previously summarised by Heath & Pelham-Clinton (1978) and Bland (1986). Since then the species has been hounded from the obscurity of rarity to become widespread but local for it seems to occur in most, if not all, habitats with an unbroken history of birch woodland. As the larval gall is quite difficult to find and the imagines have a retiring lifestyle it is a difficult species to record. In spite of this the species has now been recorded from 36 vice-counties (Figure 1) and extends from West Sutherland in

Fig. 1. Current vice-county distribution of *Lampronia fuscatella*. All records.

Scotland to the South coast of England. Surprisingly there are still no records from Ireland. The present distribution of records by vice-county number is:—

V.c.9 (MBGBI Vol. 1); 11 Denny Bog, New Forest (Anon.); 12 Newtown Common (DHS, PHS, ECPC, JRL); 13 & 14 Tilgate Forest (NFH, RF); 15 Brotherhood Wood (NFH), Blean Woods (IDF), Thornden Wood (JMCH); 16 Dartford Heath (NFH, RF); 17 Haslemere (CGB), Elstead Common (NFH), Hankley Common (RF, AJF), Thursley, N. of Guildford, Blackheath (RF); 18 Hainault Forest (AME), Epping Forest (AME, ECPC), Havering Park (NN), Bedfords Park (AME); 19 Stour Woods (JPB); 22 Upper Common, Bucklebury (AME, BRB), Burfield Common (AME); 26 Barton Mills (DLA, JRL); 37 Trench Wood (ANBS); 40 Whixall Moss (JRL, MJS); 58 Wilmslow (HNM); 59 (MBGBI Vol. 1); 60 Manchester (Anon.); 63 Skelmanthorpe (THF); 69 Windermere Station (JBH), Witherslack (LTF, AEW); 70 Orton (GBR); 74 Torrs Warren (KPB); 77 Braehead Moss (KPB, RPKJ); 80 Threepwood Moss; 81 Gordon Moss; 82 Gladsmuir (KPB); 83 Threipmuir (KPB, ECPC), Tynehead; 84 Dechmont Moss; 85 Moss Morram; 86 Ward; 87 Claysike Moss, Flanders Moss; 88 Methven Moss (KPB); 92 Dinnet Muir (DB); 95 Aviemore (ERB); 96 Tulloch Moor; 99 Gartlea (KPB); 108 Strathnaver (AFG).

(Initials of recorders/collectors in brackets.)

This list suggests that it will probably be found in suitable habitats throughout Britain if a determined search is made for it. Since starting to keep detailed records of it I have now found some 29 galls in various parts of southern Scotland. A resumé of the variety and dimensions of these galls may assist others in their searches and so help to extend our knowledge of the distribution of this elusive species.

The gall occurs on both *Betula pubescens* and *B. pendula* with no apparent preference. Possibly the species may also occasionally affect *Alnus glutinosa* as a single frass-filled gall on this tree was found in East Sutherland (v.c. 107) on 13.v.1989 but, as no incurvariid larval head capsule could be found in the gall, evidence for it belonging to *L. fuscatella* is thus purely conjectural. All the galls included in this account were found between mid-March and early May and occurred on fairly young birch trees, less that 12 feet high. They were found at all heights between two to ten feet from the ground. It should be borne in mind that these observations may be more dependent on my search pattern than on the habitat preference of the moth. All the galls occurred at a node but varied considerably in shape (Figure 2). In 76% of them a bifurcation or side branch was present at the site of the gall and in 41% of these the side branch had died. Galls tended to be somewhat spherical but this tendency became more obscure if the bifurcations were of similar diameters or if the primary twig was on the robust side of average. The smaller the diameter of

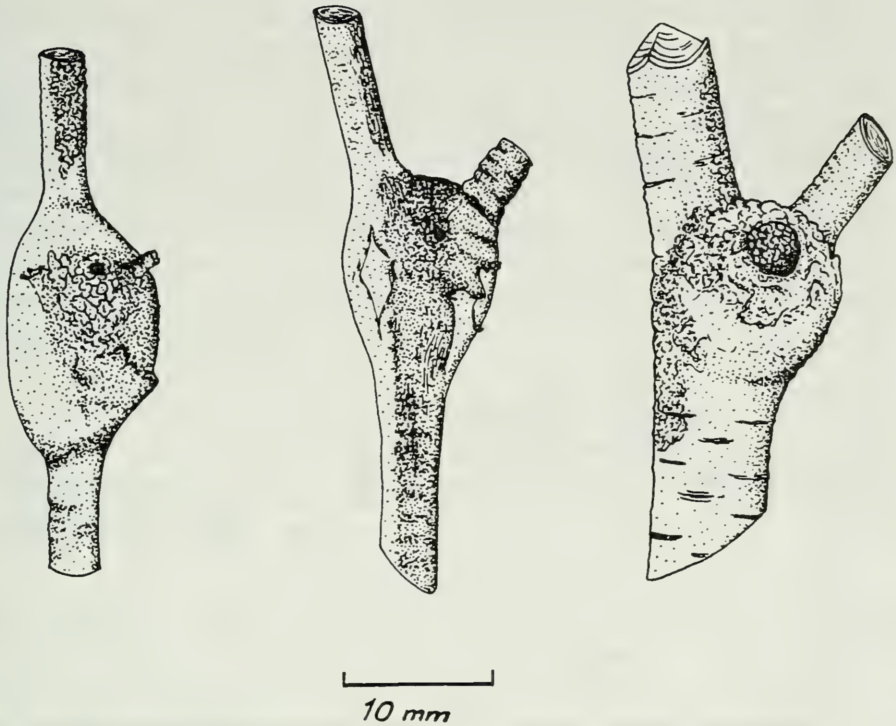

Fig. 2. Drawings of examples of galls on birch caused by *Lampronia fuscatella*.

the primary twig the more conspicuous the gall (Figure 3). The mean diameter of the gall-bearing primary twig was 5.2mm but they varied from one as small as 2.0mm to one with a diameter of 13.0mm! The galls often occur in pairs — if one gall is found there is often another within 20cm, sometimes on the same twig. Of the 29 galls, nine or 31% had their exit hole capped with frass when found. Of these, seven or 78% produced examples of the ichneumonid parasite *Panteles schuetzeana* (Roman). In the remaining two the larva had died immediately prior to pupation but did not appear to have been parasitized. I still have not reared an imago of *L. fuscatella*! Of the 20 non-capped galls, 18 exhibited an exit hole of some sort. In four the exit hole was of normal size and the degree of callous formation within the gall along with the presence of a cast head capsule but no pupal remains suggested the galls had produced moths the previous spring. The remainder of the 18 possessed a very small exit hole with the remains of a small parasitoid cocoon within, belonging to a *Bracon* sp. (Braconidae) as yet unidentified. The remaining two galls were intact — one contained a dead larva and in the other the larva was still feeding. This half-grown larva indicates that the larval stage may last at least two winters — a finding borne out by two further larva-containing galls found in early spring 1977 by the late E.C. Pelham-Clinton and myself. The scarcity of

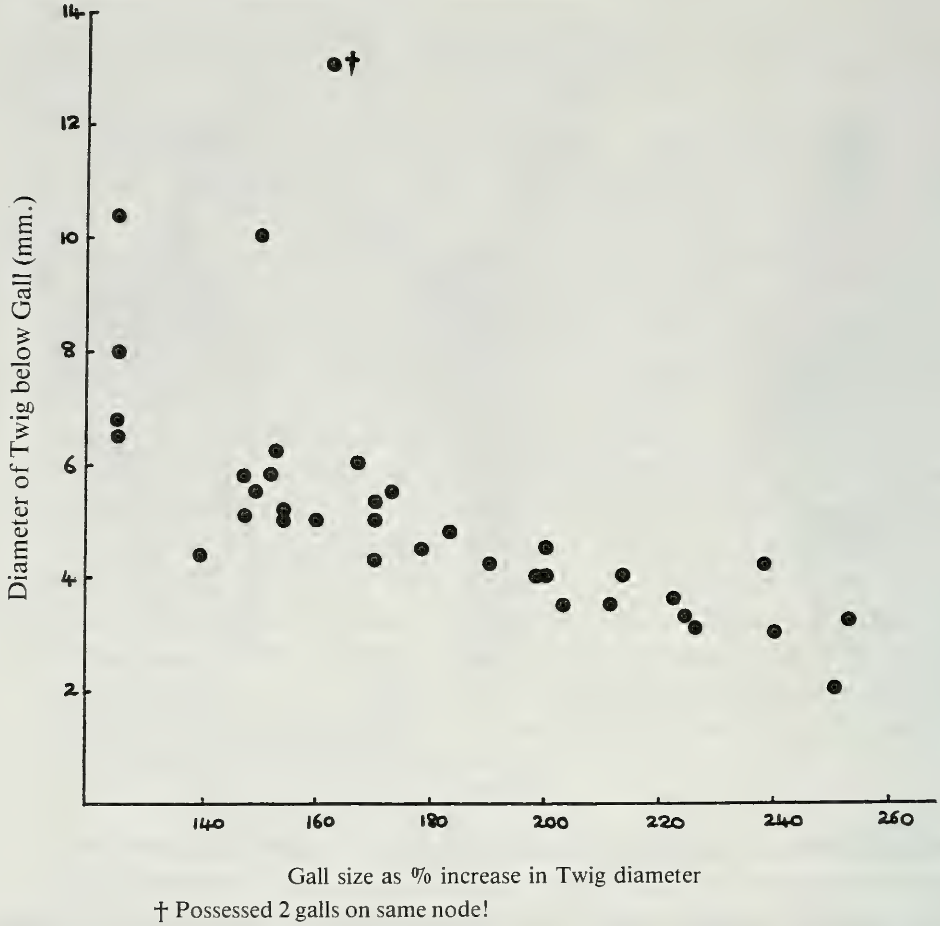

Fig. 3. Relationship of gall size to diameter of infested twig.

Group	No. of galls	Mean dimensions of twig (mm)			
		Below gall	At gall	Above gall (Main twig)	Above gall (Side twig)
All data	36*	5.2	8.9	4.8	3.0
Last year's emergence	4	4.5	8.5	3.9	2.5
Larva died	2	4.9	8.7	4.3	3.2
Larva eating	1	8.0	10.0	5.5	?
Bracon parasite	14	5.8	9.8	5.3	3.0
Panteles parasite	15*	4.8	8.0	4.6	3.1

* Seven additdional galls parasitized by *Panteles schuetzeana* and donated to Royal Museum of Scotland by J.R. Langmaid included in these groups.

Table 1. Mean dimensions of infested twigs.

galls occupied by larvae could be an indication that the larval life-history is unlikely to be more than two years. The high rate of parasitism (72%) in this sample is rather surprising in view of the apparent scarcity of the species. At least *Panteles schuetzeana* appears to be host specific (M.R. Shaw pers. comm.). In spite of the various fates that befell the galls, the mean size in the different groups was very similar (Table 1) and did not appear to be influenced by whether or not the larva had been parasitized.

Interestingly the gall containing the half-grown larva is relatively large which suggests that gall formation is influenced more by the events at oviposition or the early development of the larva than by a continual stimulatory influence of the growing larva.

Acknowledgements

I am very grateful to Dr M.R. Shaw for identifying the *Panteles schuetzeana* parasites and to the Royal Museum of Scotland for access to the additional material.

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Lycophotia porphyrea **D. & S. (Lep: Noctuidae), an unusual life history.**

On 22nd April 1987 I found a larva of *L. porphyrea* feeding on *Calluna vulgaris*. It moulted on 28th April and did not feed afterwards. When I provided the larva with some peat it made a cocoon and had pupated by 30th June when I opened the cocoon.

In 1988 I obtained ova from three female *L. porphyrea*. They began to hatch on 10th July and the larvae grew quickly, becoming fully fed by the autumn. Again, after entering the final instar they did not feed but just made cocoons and pupated. The penultimate instar larvae did not make cocoons if I provided them with peat.

The appearance of the larva in the penultimate and final instars is quite different. The illustrations in the books by Buckler, Carter & Hargreaves, Stokoe & Stovin and Wilson all show the larvae in the penultimate instar, which is the stage at which it finishes feeding and is most commonly encountered. Buckler calles the species *Agrotis porphyrea* and illustrates five larvae which he says are "after last moult". They are clearly all penultimate instar and therefore not "after last moult".

I have been unable to find any reference to the fact that *L. porphyrea* has a non-feeding final instar and it is certainly not mentioned in any of the

books devoted to larvae. I am unaware of any other species which behaves in the same way and I find it hard to imagine how this apparently futile instar can have evolved. I can think of few examples of Lepidoptera larvae with other non-feeding instars. *Zygaena* larvae have one or more non-feeding instars during diapause (Tremewan 1985). The larva of *Stauropus fagi* (L.) has a first instar during which it feeds only on its egg shell (de Worms 1979). Although it cannot be regarded as strictly non-feeding, this larva clearly consumes very little in this instar. In neither of these examples is it the final instar which is non-feeding.

The final instar of *L. porphyrea* differs from the penultimate instar in the following ways. The black markings either side of the dorsal line and below the subdorsal lines becomes very much more faint, the subdorsal lines become much less distinct and the general colour changes from brown to a pale cream.

Three of my sixteen larvae which reached the penultimate instar in 1988 were of an unusual form, lacking the subdorsal lines and with the dorsal line reduced to a very thin mark. Only one of these survived to the final instar. It was brown in the penultimate instar but very pale pink and cream in the final instar.

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Dr. B. P. HENWOOD, 4 The Paddocks, Abbotskerswell, Newton Abbot, Devon.

Eucosma metzneriana Treitschke in East Sussex.

Whilst recording Lepidoptera at Rye Harbour on the 14th July 1989 in the company of Mr C. Pratt and Mr G. Botwright, I noted an unfamiliar-looking Tortricoid moth in one of the m.v. traps operated by Mr C. Pratt. This I tentatively identified as *Eucosma metzneriana.* I have since shown the specimen to Dr J. Langmaid who has kindly confirmed my determination. I believe this to be only the third British example, the previous *E. metzneriana* being noted in Hampshire (*Ent. Rec.* **94**: 202) and Cambridgeshire (*Ent. Rec.* **89**: 329).

I would like to take this opportunity to thank Dr B. Yates for permission to run light traps on Rye Harbour LNR. — M. PARSONS, The Forge, Russells Green, Ninfield, near Battle, East Sussex TN33 9EH.

SOME COMMENTS ON THE LIFE HISTORY OF THE GARDEN TIGER MOTH, *ARCTIA CAJA* L. (LEP.: ARCTIIDAE)

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IN THE days of my childhood this was perhaps the most familiar moth to the general public where I was living, both in its adult and larval forms. It was a truly garden insect, although also associated with the numerous patches of waste ground, allotments, roadside verges and railway embankments; I allude to the neighbourhood of Bexley, Kent, in the 1920s. Nevertheless, my experience was never that portrayed by Newman (1874) . . . "you cannot pass along a sunny hedge-bank without observing it on the various kinds of dead nettle, of which it seems particularly fond; in gardens it is equally abundant on the leaves of hollyhocks, and, indeed, nothing comes amiss to it. . . .". My present garden would seem to provide an ideal habitat for the moth, and a number of its favourite foodplants abound, but in over twenty years I have not encountered a single caterpillar (and very few elsewhere), although the garden m.v. light attracts from half a dozen moths to rather less than a score each year, and very rarely a female.

Despite this being a well-known species, and often a common one, the habits of the larva have been remarkably neglected both in the standard textbooks and local works; it is another "low plants" or "*et cetera*" species. Certainly, a long list of plants upon which the caterpillar has been found could be assembled; indeed, Wilson (1880) lists two dozen larval foodplants without comment, but nowhere in the volume is assurance given that such references apply to the British Isles; this list includes poplar, red campion, rose and snowberry, but how significant are these plants in this context?

Barrett's *Lepidoptera of the British Islands* which was published at the turn of the century appears to have been the source of much information contained in later textbooks, yet in the case of *caja* little can be gleaned regarding the moth's larval foodplants and perhaps this is why so little appears on the subject in all subsequent books. Barrett states ". . . on almost every kind of herbaceous plant, even including dog's mercury, and on many shrubs; especially fond of nettles and garden weeds. . . .". At this time a warning was sounded, and this was 1895 ". . . inhabiting gardens in the outskirts of towns, in some places even more commonly than the fields and hedgerows. Formerly this was the case in all the suburbs of London, the larva being everywhere visible, but for some years past, there is a great change in this respect, and it is now comparatively seldom seen. . . .". South (1939) does in fact add a little ". . . the foliage of pretty well all low plants, and tall ones, such as hollyhock and sunflower . . ." and adding ". . . nettles and dock and other weeds around them. . . .". Newman and Leeds (1913) merely give ". . .

nettles and various low plants. . . .''. Skinner (1984) states ''. . . a wide variety of wild and garden plants. . . .''. Not very illuminating, yet this is beaten by Heath, ed. (1979) in which the larva is simply described as polyphagous! I suppose it is, but that is not much help to the reader who desires some useful information about how to find the caterpillars!

Local works, often on a county basis, were known in the nineteenth century, but not until the publication of Chalmers-Hunt's volumes on Kentish lepidoptera were we able to see a really accurate and comprehensive study; valuable though this is perhaps its chief merit is as a model for surveys in other counties, yet curiously some of the so-called ''local lepidoptera'' published subsequently have little merit, a number being largely fictional in character, while others are mere check lists dealing only with distribution, perhaps a side effect of the national distribution scheme and the m.v. light. However, check lists have their place and value, although some do possess somewhat grandiose titles which are distinctly misleading.

An excellent description of this insect's larval habitat and inclinations is given in one of the local publications, that concerning Hampshire by Goater (1974) in which he writes ''. . . common, especially so in places where there is a rank growth of *Lamium* spp., *Taraxacum* or *Senecio vulgaris* L. which appear to be the larva's favourite foodplants in the county. In the river valleys, comfrey (*Symphytum*) is often chosen; *Urtica dioica* L., too, is often eaten, but in my experience only when it grows mixed with other vegetation. . . .''. Perhaps, with minor changes in detail, this description could apply to many parts of Britain, and with such information a novice is likely to have success in finding the caterpillars of *caja*.

For Kent, Chalmers-Hunt lists *Lamium purpureum, L. amplexicaule, L. album, Urtica dioica,* dock, comfrey, *Ballota nigra, Lepidium, Aubretia,* hollyhock, dandelion and groundsel, and concludes that in the county the larva has perhaps been found mainly on *U. dioica* and *L. album*; indeed, some of the plants listed represent but a single larva on one occasion only.

My own experience in N.W. Kent is not dissimilar to the picture portrayed by Goater and Chalmers-Hunt, but differs in detail. My earliest recollections of finding the larva are of the railway embankment and waste ground west of Bexley station in the 1920s, and there they abounded on stinging nettle (*U. dioica*) and large leaved docks (*Rumex* spp.), and sometimes on white dead-nettle (*L. album*) and burdock (*Arctium* spp.); in 1925 and 1926 a number were found in a garden feeding upon an isolated Duke of Argyll's teaplant (*Lycium barbarum*), a member of the *Solanaceae*, the shrub being isolated in the sense that it grew against a shed and at its base there were virtually no weeds, being separated from the garden by a path. In the 1930s and in the immediate post-war years the caterpillars were quite common on waste ground and roadside

embankments around Dartford and the vast majority I found were on black horehound (*Ballota nigra*); much less commonly they were to be found on stinging nettle, white dead-nettle, *Rumex obtusifolius* and burdock and rarely upon purple dead-nettle and cleavers (*Galium aparine*).

On turning to L. & K. Evans (1973) for N.E. Surrey, in which records date only from 1950 onwards, a somewhat surprising statement is found — that for the area there are not many records, and four plants are listed without comment, these being radish, wallflower, stinging nettle and bramble. Is this due to a true scarcity of *caja* larvae, an apparent scarcity due to difficulty of finding them, or lack of observation perhaps related to obsession with m.v. lights? The moth is stated to be generally distributed and common throughout the area.

Palmer (1974) notes that in Aberdeenshire and Kincardine the larvae may be found on birch in the autumn, and on low plants in the spring, which would seem to further substantiate Shaw's suggestion that *caja* is one of those species in which the eggs are laid usually on trees and shrubs rather than upon the herbaceous plants on which the larvae are usually found (Shaw 1985), as does my finding the caterpillars on *Lycium barbarum*. On the other hand I have encountered young *caja* larvae just waking from hibernation amidst developing mounds of the new foliage of *Ballota nigra* growing in the middle of a wide expanse of waste ground devoid of trees and shrubs.

By virtue of the kind of habitat frequented by these caterpillars, one containing a wide variety of herbaceous plants, and their polyphagous inclination, it is not surprising that they have been recorded from a large number of plants, including some not eaten and others sampled before moving on. However, as with some other species, e.g. *Euproctis chrysorrhoea* L., in times of great abundance the number of plants upon which they are found feeding is greater, as illustrated by A. Wheeler (1957) who reported *caja* larvae on London bomb sites as abundant and ". . . feeding on a diet ranging from Buddleia to groundsel. . . .".

I have always considered that, despite what appears in some textbooks, *caja* has a quite limited range of preferred foodplants, and that these vary somewhat geographically. In 1987 and 1988 I offered a wide selection of plants to the caterpillars I was rearing to produce autumn moths, and it became quickly apparent that certain plants were consumed rapidly, others eaten to a lesser extent and some rarely touched or not eaten at all. The method employed was to supply a variety of plants, but always including a known favourite, these being white dead-nettle, stinging nettle and dock (*Rumex obtusifolius*). Of these the stinging nettle was the least popular in the sense that although readily eaten the larvae seemed to wish to change to something else after a day or so. The other two plants would become skeletonized, as would dandelion (*Taraxacum*), groundsel (*Senecio vulgaris*), knotgrass (*Polygonum aviculare*) and hollyhock (*Althaea*).

Plants introduced which were accepted, but eaten to a somewhat lesser extent were *Lycium barbarum,* black horehound (*B. nigra*), burdock (*Arctium),* plantains (*Plantago major* and *P. lanceolata*), forget-me-not (*Myosotis*), coltsfoot (*Tussilago farfara*), rhubarb (*Rheum*), lettuce (*Lactuca sativa*), common mallow (*Malva sylvestris*) and the shrubs elder (*Sambucus nigra*), bramble (*Rubus fruticosus*) and sallow (*Salix*). The following plants showed some signs of nibbling, but were evidently not favoured, purple dead-nettle (*Lamium purpureum*), henbit (*L. amplexicaule*), marigold (*Calendula officinalis*) and cabbage (*Brassica*). As cabbage is one of the recommended plants for feeding *caja* larvae when attempting continuous breeding and the two *Lamium* species are sometimes utilised by the larvae in the wild this may be evidence that different strains of the larvae take to the various foodplants with varying degrees of enthusiasm. The following were rejected, wallflower (*Cheiranthuis cheirei*), *Inula hookeri, Sedum spectabile,* hedge bindweed (*Calistegia*), ragwort (*Senecio jacobaea*), Oxford ragwort (*S. squalidus*) and Virginian creeper (*Parthenocissus quinquefolia*). It was noticeable that when the leaves provided included the tougher ones from shrubs — *L. barbarum,* sallow and bramble — the larvae preferred to rest on these, especially when changing skin; the large leaves of burdock, hollyhock and coltsfoot were similarly utilised.

I have referred to this experiment of offering an arbitrary variety of plants to *caja* larvae in captivity to prove that it has distinct preferences, and it is certainly not "almost omnivorous" as claimed by the authors of a somewhat fictional work on the lepidoptera of a certain county! The fact that around Dartford black horehound is probably its favourite foodplant means that it has local preferences, for this plant does not occur throughout its range; indeed, Chalmers-Hunt quotes H.C. Huggins who on one occasion only found the larvae on this plant at Gravesend, and wrote that this finding ". . . is somewhat inexplicable as I find the beast does not like it in captivity, but these were two or three eating it, not sunning themselves. . . .". This reference was for the first decade of this century, my observations for Dartford over twenty years later. Whether the apparent favourite foodplants noted for Hampshire and Kent apply to the remainder of the British Isles is purely a matter for conjecture. Baynes (1964 and 1970) gives no indication that the larva of this insect has ever been found in Ireland, although the moth is stated to be common and widespread, nor can I find subsequent reference to its possible discovery. An indication that there might be a decidedly different local foodplant preference in the Orkney Islands is hinted at by R. Lorimer (1983) in which he states ". . . also among *Salix aurita* on moorland . . .", but had been referring to the imago in the preceding phrase. So, is the larva actually feeding on sallow in this rather unusual habitat? If not, then upon what is it feeding?

It seems therefore that for the few parts of Britain where knowledge exists of the larvae of this moth, they are most likely to be found in certain well-defined habitats feeding upon one of a limited number of plants of the families *Compositae, Labiatae, Urticaceae* and *Polygonaceae,* although occasionally upon other plants of various families, especially when the larvae are abundant. There is evidence of local preferences regarding foodplants and also of probable differences between pre-hibernation and post-hibernation pabula. Perhaps most significant is the almost complete lack of knowledge to be found for all but a very tiny part of the British Islands.

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Hazards of butterfly collecting — Morocco, 1979

JUNE FIRST 1979 I was on a difficult mission to Morocco. All was going wrong due to misunderstandings, personality clashes, and a set of circumstances which precluded solution of problems which could normally be resolved. There were simply too many unknowns in the equations on hand and but for the moral support of a female colleague (moral in both senses of that term) I had considered cancelling the mission at considerable cost. Ten days into the mission I found myself in the lowest of spirits in Marrakesch.

It was with great eagerness that I grabbed the opportunity of a very early arrival to go butterfly collecting at the famous locality known as Oukaîmeden in the High Atlas, situated at 3,200 metres and now a ski resort. After fiddling with the incredible dashboard gearshift of my hired

Renault 4 (the most curious French invention since the guillotine) I made my way up the mountain to arrive at one of the most beautiful spots I have ever visited. Emerald green meadows were teeming with butterflies, more than 25 species, including rarities such as *Zegris eupheme, Artogeia segonzaci* and *Berberia abdelkader*. There were more specimens of *Procris* interspersed with discrete colonies of several species of *Zygaena* than I have ever seen before. I had the good fortune of twice seeing and finally photographing the mating of *Procris mauretanica* males with *Zygaena trifolii* females, in one case actually watching it happen. It was glorious, and the tribulations waiting down in Marrakesch were forgotten for three merciful hours. After three productive hours, the proverbial serpent in paradise struck. The sunshine in which I had been collecting was a shaft in heavy, thunderous clouds which were milling about the surrounding peaks. The need to stay in the sun had brought me some two and a half kilometres from the car when they finally closed in. With exquisite timing the subsequent downpour turned to sleet and hail just at the very moment when even the last bit of my underwear was wet through. Temperatures dropped to about 5° Centigrade by the time I reached the car, my hair caked in sleet.

The only thing to do was to strip. The pants were wedged in one window; the shirt in another; the vest in a third.The soggy underpants were kept on the passenger seat to cover my naked self if need should be. Here too were placed the soggy remains of my breast pocket, sundry passports, driving licences, money etc. Then down the mountains towards the hot plains of Marrakesch to dry the clothes. Half an hour later the clothes were nearly dry and I stopped to regroup. Among the papers was an envelope which my colleague had given me at 06.00 that morning when I set out south and she north with other members of the team. To be opened in emergency only, it said. This, surely was emergency! The envelope contained the funniest and most apt limerick possible on the impossibility of the mission, read under circumstances which the writer could not possibly have imagined!!

I drove back to Marrakesch, now once again clad. The limerick and the butterflies had cheered me up. I could even get to grips with the Heath Robinson gearshift. On the way back I stopped briefly and collected good series of *Syntarucus pirithous, Tarucus theophrastus* and *T. rosaceus*. Things were looking up. The mission was not going to become a jewel in my crown — but it suddenly seemed manageable.

Ten difficult days later, I was back in London, feeling that we had done the best under difficult circumstances. A year later we found that our conclusions and recommendations had been fully acted upon and resulted in very tangible improvements. Some people thank their lucky star when things go right in the face of disaster. I think the butterflies of Oukaîmeden played a role.— TORBEN B. LARSEN, 358 Coldharbour Lane, London SW9 8PL.

THE ANTS (HYMENOPTERA, FORMICIDAE) OF THE GOWER PENINSULA, WEST GLAMORGAN, SOUTH WALES

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Introduction

THE Gower Peninsula is notable for its largely unspoilt character and variety of wildlife. The variety and stability of habitat, combined with a reasonably equable climate, would be expected to make an investigation of the ant fauna worthwhile. The limited, but interesting geology and geographic distinctness make it ideal for relating the ant fauna to rock type. This might have some predictive value, to guide a survey of a larger area, such as Pembrokeshire.

Geological Factors Affecting the Ant Fauna

The underlying rock can influence the vegetation and, therefore, the ant fauna, in several ways. The main factors are:-

(1) *Soil structure and drainage.* Limestones usually drain freely, clays and shales much less so.

(2) *Soil chemistry.* The flora of an area depends on the chemical composition of the soil. An important example is the lack of extensive acid heathland on limestones.

(3) *Thermal properties* are very important where rocks outcrop, particularly if there are many loose stones as potential nest sites. Of the various rock types outcropping in Gower, pieces of pennant grit tend to provide the hottest nest sites, and old red sandstone the coolest.

(4) *Rock structure.* This affects (1) and (3). Rocks such as slates and many sandstones (including the pennant grit) split into flat stones, ideal for ants. Others, such as the old red sandstone, form more rounded boulders.

(5) *Relief and aspect.* These depend on the hardness and the dip of the rocks. They affect the microclimate and, importantly, the soil depth. The main geological features of the area are shown in Figure 1.

Results

What follows is mainly based on the results of three brief visits by the author, in August 1982, July 1983 and September 1988. Some previous records from the literature are also included. The information given for the common species is largely based on the 1988 visit, so the table below only covers sites visited then, but records from previous visits to those sites are included.

The Carboniferous limestone area was the most intensively searched because of the greater likelihood of finding rarities. Woodland areas were

Table 1. Showing the ants found at 1988 sites

V Very common or locally abundant
C Fairly or locally common
S Scarce to very rare

Rock type	Site	(No.) Habitat	*Myrmica rubra*	*M. ruginodis*	*M. scabrinodis*	*M. sabuleti*	*Stenamma westwoodii*	*Leptothorax tuberum*	*Myrmecina graminicola*	*Tetramorium caespitum*	*Lasius fuliginosus*	*L. niger*	*L. alienus*	*L. flavus*	*L. meridionalis*	*Formica fusca*	*F. lemani*	*F. cunicularia*	SITE TOTAL	Total for rock type
Recent dunes	— Oxwich Dunes	(1) Dunes	S		S							C	V	C	S				6	6
Pennant grit	— Kilvey Hill	(2) Moorland		C	C							V		V		V	C		6	6
Carb. shales	— Broad Pool	(3) Damp moorland		C	C									C					3	3
Carb. limestone	— Oystermouth Castle	(4) Ruin, gardens	C									C		C					3	14
Carb. limestone	— Langland Mumbles	(5) Cliffs	S		V	V				S		C	V	V		S		C	9	14
Carb. limestone	— Pwlldu Head	(6) Cliffs		C		V			S			C	V	V		S		C	8	14
Carb. limestone	— Oxwich Point	(7) Cliffs and woodland				C	S	S		S	S	C	V	V		S		C	10	14
Carb. limestone	— Port Eynon	(8) Cliffs		C		C		C	S	S		C	V	V				C	9	14
Old red sandstone	— Penmaen	(9) Grass — moorland		V	V	V								V					4	4

the least visited, for two reasons. Firstly, the ant fauna is usually poor in Britain. Secondly, it is relatively unaffected by changes in geology. Kilvey Hill has been included, despite being east of Swansea, as it is the most representative pennant grit site.

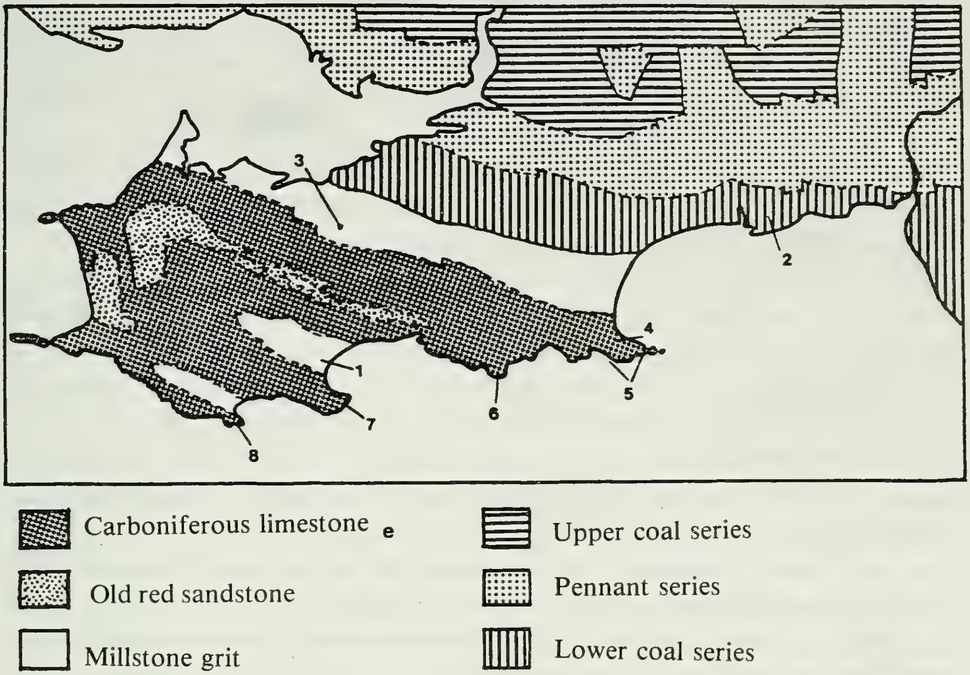

Figure 1. Geological map of Gower (after T.R. Owen). The numbers refer to the sites in Table 1.

As no really comprehensive survey has been conducted, the list includes several species that the author feels may be revealed by further searching. Recorded species are numbered. An asterisk (*) by the number indicates a new record for Gower.

[*Ponera coarctata* (Latreille, 1802). Thorough searching of mossy, semi-shaded sites, such as old quarries may yet reveal this species, most likely on the Carboniferous Limestone.]

*1 *Myrmica rubra* (Linn, 1758)

2 *M. ruginodis* Nylander, 1846

3 *M. scabrinodis* Nylander, 1846

4 *M. sabuleti* Meinert, 1861

The occurrence of the four common *Myrmica* species in relation to relief and aspect is illustrated in Figure 2. *M. rubra* and *M. ruginodis* live in more thickly vegetated areas than *M. scabrinodis* and *M. sabuleti*. *M. rubra* and *M. sabuleti* need warmer sites, so they have more restricted distributions. If the hill or cliff top is well vegetated *M. scabrinodis* may be absent. Relief and aspect are more important than rock type, although *M. sabuleti* was not found at Kilvey Hill.

M. schencki Emery, 1895. This scarce and secretive species lives in sand dunes and dry pasture. It has not yet been taken in Gower, but is likely to occur at Oxwich or Whiteford Burrows, as Collingwood found it on Kenfig

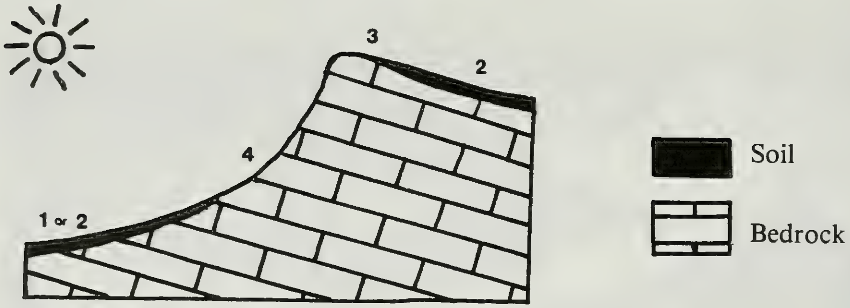

Figure 2. The effect of relief and aspect on the occurrence of *Myrmica* species.

1. *M rubra*
2. *M. ruginodis*
3. *M. scabrinodis*
4. *M. sabuleti*

Dunes in 1963. The only other Welsh record is that of Hallett (1915) at Sully (Donisthorpe, 1927).

M. lobicornis Nylander, 1846. Not yet recorded in Gower, but was taken by the author at Margam Reservoir, Port Talbot in 1979 and 1982. It is most likely to occur in heathy areas on the pennant grit and coal measures, away from more aggressive species.

*5 *Stenamma westwoodii* Westwood, 1840. This elusive species was taken twice in the woods on Oxwich Point in July 1983, including three workers seen near a *Lasius fuliginosus* trail. A new record for Gower. There are many other potential sites, including the Clyne and Bishopston valleys.

[*Solenopsis fugax* (Latreille, 1798). This tiny, subterranean species is usually found under deep stones near the nests of *Formica* and *Lasius* spp. It could conceivably occur in sunny, sheltered sites below the Carboniferous limestone cliff.]

*6 *Leptothorax acervorum* (Fabricius, 1793). The only record was a deleate female seen wandering over a dry-stone wall near Whiteford Burrows in July 1983. It should occur widely, particularly around heathy woodland borders on Middle and Upper Carboniferous strata.

*7 *L. tuberum* (Fabricius, 1775). A new record for Gower, the only previous Welsh record being a single worker, identified by Donisthorpe, taken from Cardiff docks in 1938. It was first taken at Port Eynon in 1982. Since then it has also been found near Rhosilli and Oxwich. The two colonies at the latter site were in a surprisingly damp and shady gulley below the woods on the east side of the point. In 1988 one colony found at Port Eynon was nesting in a gorse stump.

Surprisingly, it was not found at Pwlldu Head, or between Langland and Mumbles. If it is genuinely absent, an explanation is needed. It might occur on the Carboniferous limestone in Pembrokeshire, particularly west of Stackpole Quay or south of Penally.

8 *Mymecina graminicola* (Latreille, 1802). First recorded by Collingwood

at Rhosilli in 1963. In August 1982 a single worker was taken by the author, under a stone at Port Eynon. In 1988 it was taken at Pwlldu Head. About a dozen workers were found investigating some partly crushed *Lasius flavus* pupae and workers under a stone that had presumably been trodden on by the author not long before. Single workers were also found under two stones, one to two feet either side of the first. One worker crawled into a *Lasius niger* nest when disturbed.

Persistent searching under stones could reveal this interesting species below any of the Carboniferous limestone cliffs. The only other published Welsh locality is at Sully (Hallett, see Donisthorpe, 1927).

9 *Tetramorium caespitum* (Linn, 1758). This species is sparsely distributed, favouring sunny, sheltered sites below the Carboniferous limestone cliffs

10 *Lasius fuliginosus* (Latreille, 1798). This interesting species was found at two sites in 1983—the woods on Oxwich Point, and at the edge of conifer plantations on the dunes at Whiteford Burrows. It is a temporary social parasite on *L. umbratus* group species and, being far more conspicuous than its hosts, it is a useful indicator of their presence.

11 *L. niger* (Linn, 1758). The "common black ant" is widespread, but is only really abundant on the pennant grit and around human habitations.

12 *L. alienus* (Förster, 1850). The commonest ant over large areas of dunes, it also outnumbers *L. niger* on the less well vegetated areas of the Carboniferous limestone cliffs. It was not taken on Kilvey Hill or any other inland site. One nest below Pwlldu Head contained a number of specimens of the beetle *Claviger testaceus.*

13 *L. flavus* (Fabricius, 1781). The commonest ant in Gower, it is almost universal and is only absent from virtually grass free areas where it cannot tend root aphids.

14. *L. umbratus* (Nylander, 1846). This strictly subterranean species has not been taken by the author, but there are old records from Worms Head and Horton (see Donisthorpe, 1927). One, if not both, probably refers to *L. meridionalis.* There is also a more recent record from Whiteford Burrows (Cotton, 1967). *L. umbratus* should have been the host for the *L. fuliginosus* taken in the woods at Oxwich, but *L. meridionalis* sometimes occurs, atypically, in woodland in Suffolk. This and the following two species are temporary social parasites on *L. niger* and *L. alienus.*

15 L. meridionalis (Bondroit, 1919). This species is often confused with *L. umbratus.* It has also been treated as a synonym of *L. rabaudi,* which is a distinct species occurring in Eastern Europe. It typically nests in dunes and heathland. It occurs at Oxwich, and almost certainly at Whiteford Burrows.

[*L. mixtus* (Nylander,1846). This species may well occur in pasture or below cliffs, particularly on the Carboniferous limestone. Like other *L. umbratus* group species it is easily overlooked due to its subterranean habits.]

16 *Formica rufa* Linn, 1761. There are old records near Gower at Swansea, Briton Ferry and Baglan. It may still occur, most likely in heathy woodlands on Middle and Upper Carboniferous strata.
17 *F. fusca* Linn, 1758. Rather scarce on the Carboniferous limestone, usually occurring in less sunny or damper locations, or where the outcrops are small and grassy with little scree. Interestingly, it was not seen on the old red sandstone at Penmaen. It is abundant half way up the south slope of Kilvey Hill (pennant grit).
*18 *F. lemani* Bondroit, 1917. Several colonies were found at Kilvey Hill, on a gentle north-west slope just below the summit (i.e. at about 600ft).
19 *F. cunicularia* Latreille, 1798. This species is fairly common below the Carboniferous limestone cliffs, completely replacing *F. fusca* in many places.
[*F. transkaucasica* Nasonov, 1889. An old (1913) record for Rhosilli is mentioned by Donisthorpe (1927). This is probably an error, and might refer to *F. lemani.* There is a slight possibility that it could occur in the boggy heathland of that area.]

Summary

A total of 19 species have been recorded, 17 by the author. The records of *Myrmica rubra, Stenamma westwoodii, Leptothorax acervorum, L. tuberum,* and *Formica lemani* are the first for Gower, but *Lasius umbratus* and *Formica rufa* were not found. The presence of *Stenamma, L. tuberum* and *Myrmecina graminicola* is noteworthy as they are characteristic southern species. The Carboniferous limestone does appear to have the richest and most interesting fauna, with 14 species.

Acknowledgements

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MELANIC ABERRATIONS OF THE SILVER WASHED FRITILLARY (*ARGYNNIS PAPHIA* L.) IN NORTH DORSET IN 1986, AND THE RELEVANCE OF TEMPERATURE ON THE OCCURRENCE OF SUCH FORMS IN THE WILD.

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Introduction

MELANIC aberrations of *A. paphia* are very scarce but have occasionally occurred in some numbers, usually together with an increase in the total population of the species.

Russwurm (1978) gives these exceptional seasons as 1881, 1941, 1942, 1944 and 1976. The last of these was possibly the most remarkable of all as regards the number of aberrations. Lipscomb (1978) records the capture of 35 major aberrations in one south Wiltshire woodland! Because aberrations of *paphia* are so spectacular they have always been prized by collectors and assiduously searched for, and it is therefore likely that this list of outstanding years represents the complete record for the last hundred years or so.

The melanic aberrations may take the form of ab. *confluens* Spuler and *ocellata* Frings in which the marginal spots are joined up, ranging through to extreme developments of these and other black forms, the most extreme being the heavily melanic ab. *nigricans* Cosmovici.

Occasionally these aberrations have turned up in other years, although rarely and usually singly. They may be of any of the forms found in the major years. An unusual aberration (ab. *glomerata* Esp.) taken in 1979 is illustrated (Fig. 1).

Experimental evidence showing that melanic aberrations can be deliberately produced by varying temperature is discussed below.

Experiments with temperature

Towards the end of the nineteenth century Professor M. Standfuss (Standfuss, 1900) carried out an extensive programme of experiments spanning 12 years and involving 42,000 specimens of 60 species of Lepidoptera. He investigated the effect of unnaturally high and low temperatures on the newly formed pupa (the stage at which the pigment is laid down on the wings and therefore at which the pattern is susceptible to external influences). He found that he could produce a variable percentage of extreme melanic aberrations of Nymphalid butterflies from groups of pupae treated to either unnaturally high (40 - 45°C) or low (0 - 20°C) temperatures.

Since Standfuss' time many people have reproduced these experiments with similar results, most recently and extensively Karl Bailey, whose

meticulous work has yielded valuable information of the subject. Whilst it is not known how extreme temperatures cause changes in patterning, nor why not all treated pupae produce aberrations, Karl Bailey has shown that there is almost certainly no genetic influence involved.

This work suggests that the upsurges of melanic aberrations in *paphia* in the field may be linked to unusual climatic conditions, and the present study aims to draw a comparison between wild caught aberrations and the temperatures at the time of pupation.

The 1986 season

1986 was the most recent year in which a population explosion and upsurge of aberrations occurred in *paphia,* and a few notes may be of interest. The winter of 1985/6 was cold with long spells below zero in North Dorset. In this area, although about two weeks late, *paphia* was much more abundant in 1986 than usual in the two woodlands studied, and a number of extreme aberrations were found.

The first was a fine male ab. *confluens* taken by Eve Barrett on 18th July (Fig. 2). Two days later an extreme mixed gynandromorph (mixed type and f. *valezina* Esp.) was seen on the same bramble patch, evaded capture, and was finally caught on 22nd July. Gynandromorphs are not temperature-related and the appearance of this specimen along with melanics was coincidental. A male showing *confluens* on the hindwings only was seen, also on the same bramble patch on 21st July. On 18th, in a locality a few miles away Ross Young photographed a superb male *confluens* and watched, for 15 minutes, an extreme black specimen (probably ab. *nigricans*) perched out of reach on an ash tree. In the same area, on 22nd, Ross took a very good female *confluens* (Fig. 3) and a less extreme male (Fig. 4). A few days later (no date available), a male *confluens* was taken in the first locality and another extreme black form seen at close range. After this no further aberrations were seen.

Comparison of wild-caught specimens and natural temperatures:

As it is during the early pupal stage that the insect's developing pigments are susceptible to temperature shocks, any correlation between temperatures and wild aberrations should refer to this stage of the life cycle. As the length of the pupal stage will vary from year to year depending on weather conditions over that year, for present purposes a broad generalisation must be made. Using data kindly supplied by Ralph Tubbs from two precisely recorded breeding experiments under normal conditions, the duration of the pupal stage appears to vary between 23 and 33 days.

Examination of specimens from private collections and in the series in the Rothschild-Cockayne-Kettlewell collection at the British Museum (Natural History) gave dates of capture of aberrations. The time the insect

Figures 1 - 4 *Argynnis paphia* aberrations. 1: ab *glomerata* Esp. female. North Dorset 1979 (R.D.G. Barrington); 2: ab *confluens* Spuler. Male. North Dorset 18.vii.1986. (E. Barrett, coll. J.B.A. Simner); 3: ab *confluens* Spuler. Female. North Dorset, 22.vii.1986. (R. Young); 4: ab *confluens* Spuler. Male. North Dorset 22.vii.1986. (R. Young).

may have spent in the pupal stage (23 - 33 days) was subtracted from the date of capture to give a period during which pupation would have taken place. This basic calculation assumes that the aberration emerged on the

day of capture. To minimise this potential error data was, except in one case, used from specimens in very good condition.

The tables show daily maximum shade temperatures for all major *paphia* years since the beginning of the century (daily minimum temperatures are not recorded as they were unexceptional and are assumed to have no influence on the production of aberrations). 1977 is included as Lipscomb (Lipscomb,1978) records the capture of four major aberrations in one area that year. Up to and including 1944 the temperatures were recorded in South Farnborough, Hampshire. As most aberrations in this period were taken in the New Forest this is a conveniently local set of records. For the years 1976 - 1986 the records are from Middle Coombe in North Dorset. As all specimens in this period are from South Wiltshire and North Dorset this is also a relevant site for temperature recordings.

The average daily maximum temperature for June over the last decade at Middle Coombe was 19°C. So 21°C was taken, arbitrarily, as a significant departure from the average temperature, and all days at, or above this are marked with an asterisk, so that spells of exceptionally warm weather can easily be followed. All temperatures are taken to the nearest whole numbers from the records received.

Notes on individual years

1918: Data from only one very worn specimen could be found. As this was the only aberration available its data was used (the only specimen in anything other that good condition from which data was drawn). It was taken on 18th July and was judged to have emerged two weeks prior to capture — 4th July. This individual should have pupated between 24th May and 11th June. This corresponds well with unusually hot days.

1919: Eleven specimens were available, dates of capture being between 8th -17th July. This gives a pupation period for all specimens of 5th - 24th June, which matches very precisely a hot spell in that year.

1941: Eleven specimens also were available, dates of capture being between 12th -28th July, giving a pupation period of 9th June - 5th July. Almost all of these specimens were taken during the latter part of July, and this gives a very good correlation with the hot spell of this year.

1942: Only two specimens were available, these being captured on 17th and 21st July; a pupation period for both of 14th - 28th June. A good correlation with the hot spell.

1944: No specimens could be found for this year. Indeed there appears to be a discrepancy over this year as Lipscomb (1978) does not list it as one of the major years. Certainly it was not an exceptionally hot year in the period under study, and no more can be said until further information is available.

1976: Seven specimens gave capture dates of 5th - 10th July.These would have a pupation period of 2nd - 17th June. Although this gives good

Table 1. Daily maximum temperatures at South Farnborough, Hants, 1918 - 1944 (degrees Centigrade).

June	1918	1919	1941	1942	1944
1	*27	*27	17	19	20
2	*27	18	13	*23	20
3	*22	16	11	*28	*23
4	17	17	*24	*29	*22
5	19	*24	14	*29	17
6	*22	*26	18	*31	16
7	18	*26	20	19	18
8	*21	*23	18	18	17
9	19	*22	15	15	19
10	18	*24	11	16	17
11	*22	*27	17	18	16
12	*22	*22	18	11	*21
13	*22	19	17	16	*21
14	18	*23	16	17	18
15	17	*26	*22	14	19
16	17	*26	*23	18	*22
17	18	*25	*24	20	19
18	16	*26	*27	17	*22
19	18	*22	*27	18	19
20	20	13	*29	*27	*23
21	19	18	*30	*26	17
22	19	*21	*32	*27	*23
23	19	19	*24	*28	18
24	18	18	*26	*24	*24
25	18	18	*27	19	*22
26	20	16	*24	*23	16
27	*22	18	*22	*22	16
28	*21	*22	*23	*23	18
29	*22	17	*24	*30	*21
30	*26	16	*26	*27	*21
July					
1	*27	14	*27	*23	20
2	*22	16	*29	*26	*21
3	*21	18	*28	20	18
4	*24	17	*22	*21	*22
5	*24	20	*25	*22	19
6	*24	17	*27	*22	*25
7	*26	14	*30	*22	*21
8	*26	14	*32	*21	*22
9	*21	*24	*28	*21	18
10	18	*23	*30	14	19

Table 2. Daily maximum temperatures at Middle Coombe, neare Shaftesbury, Dorset, 1976 - 1986 (degrees Centigrade).

June	1976	1977	1986
1	16	15	16
2	17	18	18
3	18	18	13
4	18	*23	13
5	18	19	14
6	*21	14	15
7	20	15	15
8	*24	14	17
9	*28	16	15
10	*26	16	14
11	19	14	17
12	*21	13	20
13	*21	14	*21
14	*21	13	*23
15	*24	13	*25
16	*23	12	*27
17	18	18	18
18	17	20	*21
19	*23	12	*22
20	15	12	*22
21	19	13	*21
22	*22	12	17
23	*26	20	17
24	*27	19	16
25	*36	18	*23
26	*32	18	*27
27	*33	18	*30
28	*33	19	*29
29	*33	16	*24
30	*31	16	*24
July			
1	*30	19	*25
2	*33	20	*26
3	*34	*24	*22
4	*33	*27	*22
5	*33	*27	19
6	*31	*27	20
7	*32	*26	19

correspondance with some hot days it misses the remarkable heat wave of late June and early July. The capture of so many aberrations in 1976 suggests that something very unusual (ie. the record-breaking temperatures

of the late June - early July period) was acting on the pupae. In this case it may well be that pupation did take place during this hottest period and that the extreme heat caused the pupal period to be shortened.

1977: Four specimens give capture dates of 8th - 15th August — a pupation period of 5th - 23rd July. This corresponds very well with a hot spell (temperature information only available for the early part of this period).

1986: Dates of capture of five specimens caught between 18th - 25th July give a pupation period of 15th June - 2nd July. Again an excellent correlation with the heatwave.

Conclusions

The results show a clear correlation between spells of abnormally high maximum temperatures and the capture of extreme melanic specimens of *paphia.* This confirms the suggestion that unusually high temperatures in nature cause the appearance of melanic *paphia* (and doubtless other Nymphalid butterflies), just as they do in controlled experimental conditions.

One question often raised is that the temperatures needed to produce melanic specimens in captivity (40 - 45°C, as recorded in the Standfuss experiments) is far higher than the highest recorded in natural conditions (36°C on 25th June 1976), so it appears that pupae in a natural state never experience temperatures high enough to cause the production of aberrations. Why then is there such a good correlation in the data given above? The answer is that air temperatures, as are all those recorded and given in meteorological reports, often bear little relation to the internal temperature of living, cold-blooded animals. For example Keith Porter (pers. comm.) has recorded that internal temperature of larvae of the Marsh Fritillary (*Eurodryas aurinia* Rott.) as being over 35°C when the air temperature was little above 0°c. This is because an object can absorb the sun's radiated heat to build up temperatures far in excess of that of the air. Temperatures are usually given as shade readings. This is because, just as the *aurinia* larva absorbs heat when it suns itself, so a thermometer gives a very high reading when exposed to the sun due to its absorbing heat. Shade readings are a more real indicator of air temperature, but not insect body temperature.

In other words objects can absorb heat and become far hotter than the air temperature if exposed to the sun. If then a *paphia* larva should pupate in the shade but be exposed to the sun later in the day as the earth revolves, the pupa could then quite possibly experience internal temperatures in the range necessary to produce aberrations.

Acknowledgements

I would like to thank John Simner and Ross Young for allowing me to photograph their fine aberrations, Ralph Tubbs for supplying me with vital

information from his meticulously recorded breeding experiments and Karl Bailey for much interesting and useful information from his extensive experiments. For the data from specimens in the British Museum (Natural History) I am grateful to David Carter for allowing me free access to the National collection.The temperature records up to 1944 were supplied by the National Meteorological Archives in Berkshire and permission to reproduce them was given by Her Majesty's Stationery Office in Norwich. I am most grateful to Peter Cooper who supplied me with the temperature records for the period of 1976 - 1986 and took much trouble in sending me precise details covering my many enquiries.

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Natural foodplants of the larva of *Sideris albicolon* Hübn, the White Colon, (Lep.: Noctuidae)

During late August in both 1987 and 1988 I found larvae of this species at Sandwich Bay, Kent. Larvae were found on four species — sea sandwort (*Honkenya peploides*), sand spurrey (*Spergularia rubra*), restharrow (*Ononis repens*) and narrow-leaved plantain (*Plantago lanceolata*).

The majority of larvae were found on *Ononis* and, except for one which had climbed a grass stem, all were at ground level on plants only a few inches high. Taller clumps of *Ononis* were not utilised, although larvae of the bordered sallow (*Pyrrhia umbra* Hufn.) were found on the larger plants. *Albicolon* larvae ranged considerably in size, from half to fully grown. During the hours spent searching it became apparent that the larvae favoured the narrow strip of soft, sandy ground between the roadside

(where the sand was compressed by car tyres) and the shingle beach on the seaward side of the sand dunes. Larvae were not found outside this zone, even though *Ononis* grew nearby.

Larvae were very localised, and during the nights of 22nd and 28th August, 1987 and 24th August 1988 I found only 16 larvae in all. Some had a blotched pattern on the skin, and subsequently died. Small larvae were very difficult to breed under artificial conditions. No parasites were bred.

The pupa has a strange habit — when placed in a box of sand, it pushes itself to the surface within a couple of days, repeating the trick if buried again! — J. PLATTS, 11 Maydowns Road, Chestfield, Whitstable, Kent.

Hypena crassalis Fab., the Beautiful Snout (Lep.: Noctuidae) new to Warwickshire

I was pleased to record a male specimen of *Hypena crassalis* at light on 1st July 1989 at Snitterfield Bushes, a woodland reserve and an SSSI. The wood is approximately three miles north of Stratford-on-Avon.

The normal foodplant, bilberry (*Vaccinium myrtillus*), is absent from this locality as are the possible alternatives, cross-leaved heath (*Erica tetralix*) and heather (*Calluna vulgaris*). There appear to be a number of records of this moth well away from its recognised foodplants — see for example *Ent. Rec.* **93**: 241 and **94**: 44. — A. GARDNER, Jackson's Farmhouse, Charlecote, near Warwick.

Book Talk 11.

Many researchers in the field of entomology must be thankful to Pamela Gilbert for her *Compendium of the biographical literature on deceased entomologists* (British Museum (Nat. Hist.), 1977). Less well-known is Reinhard Gaedike's *Supplement* to the *Compendium,* which appeared in 1985 in *Beitr. Ent., Berlin* **35**: 2: 369-408. Moreover, Miss Gilbert tells me that there is in the Library of the Department of Entomology (BMNH), a card index containing additional material to form the basis of a further supplement, and that those interested are welcome to use the index and are also invited to add to it.

The Entomological Magazine, 5 vols., 1833-1838. Those who have perused this fascinating old periodical, may recall the pretty little vignette (in vol. 4, page 185; also reproduced in Classey's facsimile of *Memoir of the life and works of Edward Newman,* page 10) of the Bull Inn, Birch Wood Corner in N.W. Kent, and once famous as the venue for the annual festivals and symposia of the Entomological Club. The adjoining Birch Wood, though much worked during the first half of the 19th century, was hardly noticed since 1860. Many rare and interesting species occurred there including *Apatura iris, Endromis versicolor* and the coleopteron *Lycoperdina bovistae.* In 1836, Edward Newman (*Ent. Mag.* 3: 307)

remarked that "Birch Wood, as a locality for insects, has no equal in the vicinity of London . . .". And goes on to give a description of the wood, an account of some of its entomological and botanical treasures and a graphic description of his meeting there with a quaint old brother of the net (Joseph Standish). Alas, virtually nothing remains today of this one-time entomological El Dorado.

I should be most grateful to anyone who can please tell me of the present whereabouts of J.C. Melvill's *Compendium entomologicum manuscript journal, 1865-76* (being a manuscript account of his collecting excursions). Bound in half morocco, this small quarto was listed on page 35 of E.W. Classey's 1955 sale catalogue no. 21. — J.M. CHALMERS-HUNT, 1 Hardcourts Close, West Wickham, Kent BR4 9LG.

Remarkable web-building feat of Common Cross Spider *Araneus diadematus* Clerk.

Early in the morning of 17.x.1988 I noticed that an adult female *Araneus diadematus* (Araneae: Argiopidae) had strung the top support line of its web from the top of the outside garage (two metres high) of my former home in Clevedon, Avon, and right across the lawn to the Leyland Cypress hedge opposite — a distance of 4.575 metres. It caused me to ponder how it had achieved this feat. Presumably, it did not swing across this huge gap, but climbed down the hedge, crawled across the lawn and climbed the garage wall, then returned to the hedge, drawing out its silken line behind it and pulling it taut on reaching the desired position on the hedge against which the main web was constructed.

Next day, the web was destroyed by heavy rain during the afternoon. On the morning of 21.x.1988, I discovered that it had constructed a new web with double support lines stretching from the Leyland Cypress hedge to the top of the bird table in the middle of the lawn, also a distance of 4.575 metres.

Incidentally, while writing of this spider,it may be worth mentioning that on 1.x.1988 I came upon a male Meadow Grasshopper *Chorthippus parallelus* (Zetterstedt) trussed-up in the web of a beautiful orange-brown *A. diadematus* at the edge of a bramble clump at Walton Castle Hill, near Cleveland, Avon. — J.F. BURTON, Wasserturmstrasse 53, 6904 Eppelheim-Heidelberg, West Germany, 31.vii.1989.

Dipterous prey of Scorpion-fly *Panorpa communis* L. (Mecoptera: Panorpidae).

In view of the paucity of records of the prey of Scorpion-flies, I think it worth recording here that on Kenn Moor, near Yatton, South Avon on 3rd July 1983 I came upon a female *P. communis* perched on a leaf and feeding from a medium-sized dipteron which I was unable to identify. I do not

know whether it had captured its prey or found it moribund or already dead. — J.F. BURTON, Wasserturmstrasse 53, 6904 Eppelheim-Heidelberg, West Germany, 5.v.1989.

***Epiphyas postvittana* (Walk.) (Lep.: Tortricidae) in Wales.**

Among Microlepidoptera sent to me for identification from the Rothamsted Insect Survey light trap operated by R. & M.V. Smith in Cardiff (Site No. 347, OS grid ref. ST 199789) was a single specimen of *Epiphyas postvittana* (Walk.) which came to the trap on the night of 18th-19th April 1989 and is apparently the first record from Wales. Eight further specimens were recorded from the same source between the 10th and 31st May and it is evident that the species is breeding locally. *E. postvittana* is a polyphagous species of Australian origin and an account of its history and distribution in England since it was first found to be breeding in Cornwall in 1936 is given by C.R.B. Baker (1968, *Ent. Gaz.* **19**: 167-172). In addition to the present record from South Wales the species is known from most south coast counties from Cornwall and Devon to Kent and Essex as well as from the London area. — E.F. HANCOCK, Abbotsford, Belmont, Ulverston, Cumbria.

***Cyclophora pendularia* Cl. (Lep.: Geometridae) in a new Dorset location.**

I operated a Robinson trap during the night of 14/15 July 1989 amongst small-leaved sallow bushes in the Luscombe Valley Nature Reserve, which lies within 10 km square SZ08 near the eastern boundary of v.c.9 (Dorset). The catch included one fresh male specimen of the second generation of *Cyclophora pendularia* Cl., the Dingy Mocha. The species has been given a scarcity rating of Cat. 3 (Rare) in the British Red Data Book 2, Insects (NCC, 1987).

Luscombe Valley Nature Reserve has apparently not previously been surveyed for Lepidoptera. It is a small low-lying isolated pocket of undeveloped countryside lying between Poole Harbour and the vast residential and built-up area to the east. It seems not unlikely that there is a resident colony of *C. pendularia* on the reserve; otherwise the specimen may have come from one of the known breeding sites on the Isle of Purbeck on the other side of Poole Harbour or perhaps from the north where the species has recently been detected (*Ent. Rec.* **99**: 184 and **101**: 184).

My thanks are due to Brian Baker for confirming the speciation, and to Poole Borough Council for permission to operate a trap in their nature reserve. — G.G. EASTWICK-FIELD, Little Earlstone, Burghclere, Newbury, Berks.

Unusual abundance of *Celastrina argiolus* L. (Holly Blue) (Lep.: Lycaenidae) in North London.

In most years I usually see only one or two specimens of *Celastrina argiolus* L. in my north London garden, which abuts Coppetts Wood Nature Reserve (TQ 276 916).

In 1989 specimens were seen every few minutes during the hot dry spell from May to July. These were mostly flying in an east-west direction along the margin of the wood and pausing to investigate a prolific growth of ivy on my garage roof.

Colin Plant (1987, *The Butterflies of the London Area,* p.99) notes that this butterfly usually occurs at low density. — KENNETH G.V. SMITH, 70 Hollickwood Avenue, London N12 0LT.

Larvae of *Anthocharis cardamines* (L.) (Lep.: Pieridae) feeding on *Reseda luteola* L. in Wiltshire.

We encountered six, almost full grown larvae of this species, fully exposed, on the flower spikes of *R. luteola* (one per plant) in partial shade amongst scrub on Cow Down, north of Tidworth, Wiltshire, on 25th June 1989. Some of these larvae were observed feeding on the florets, and in all cases the flower spikes had been heavily cropped in this manner. We know of no published record of this species as a foodplant of *A. cardamines.* A.M. Emmet (in *The moths and butterflies of Great Britain and Ireland,* **7** (1), 1989) cites S.P. Courtney (*Oecologica,* **54**, 1982) as reporting two species of Resedaceae on which females had been observed to oviposit. However, Courtney's paper does not mention any species in the genus *Reseda.* — G.R. ELSE, Northcroft, St Peter's Road, Hayling Island, Portsmouth, Hants PO11 0RX & S.P.M. ROBERTS, 9 Days Court, Hardy Crescent, Wimborne, Dorset BH21 2BA.

Further notes on Eupithecia tripunctaria H.-S. (Lep.: Geometridae).

It now seems appropriate to summarise what has been said recently about this moth. I refer to contributions recently in this Journal of B.K. West (*antea* **101**: 57); G.M. Haggett (*antea* **101**: 184) and A.M. Emmet (*antea* **101**: 185).

West quotes various sources and comes up with pretty good evidence that, because the species flies mainly in May - June and again in July -August, it might well be bivoltine. He adds, however, that B. Skinner ". . . perhaps wisely does not commit himself on the question of voltinism . . . ". West is supported by Emmet, who gives first-hand evidence of two main emergence periods — 25 May to 19 June and 9 - 28 August in Essex. Unfortunately, he gives no dates for larvae, which he finds commonly ". . . in local woodland rides . . .". Nor does he cite the foodplant.

Thus far we are left with the possibility of two broods, but no data as to

what happens to the eggs, presumably laid in May/June. So we come to Haggett, who somewhat complicates matters by stating that he has reared larvae from May moths on cow parsley, but that the pupae therefrom lay over until the following spring. Furthermore, he once found many July larvae feeding on elder flowers: all produced moths the following spring. Thus we must seriously consider two races of this moth; both having a 12-month cycle — one May - May and the other July - July. The first would feed on cow parsley or elder; the second on angelica. This is NOT the same as bivoltinism.

What seems essential for bivoltinism is proof that the early summer moths produce larvae which pupate and produce moths in July - August. To this end Haggett says, a foodplant must be found from which larvae can regularly be swept in early summer, which produce moths later in the same year.

I must now introduce a factor not, as yet, considered in recent contributions. Like many others, I have caught imagos in June and again in the late summer. In no case have I found any marked difference in them; either in size or markings. This is not supportive of this moth having two broods. Consider how different are the first and second broods of such species as *Diarsia rubi* View, *Cyclophoria punctara* L., *Eupithecia nanata* Hb. and *Gymnoscelis rufifasciata* Haw.

In *rubi* there is a difference in both size and markings; in *punctaria* a difference in markings; in *nanata* and *rufifacsiata* an extraordinary difference in size. The latter two moths are of special relevance to any consideration of double-brooding in *tripunctaria.* The same applies where double-brooding occurs in Rhopalocera — quite distinct first and second broods. One final point. I have reared many larvae found on angelica in the autumn — without exception the moths therefrom appeared in late April through May the following spring.

I summarise as follows:

(a) there are two main emergence periods (West and Emmet);
(b) the moth occurs in every month from May to September (Skinner);
(c) no one has shown that the moth varies in any significant way, no matter in which month it appears (Simson);
(d) early summer pupae lie over to the following spring and do NOT produce a July - August eclosion (Haggett)
(e) autumnal larvae pupate in the late autumn and also produce moths in the following spring (Simson);
(f) the larvae were plentiful on elder flowers in Lincolnshire in 1978, but never again found on this tree (Haggett).

There is a problem! — Brig. E.C.L. SIMSON, 4 Plowden Park, Aston Rowant, Oxon OX9 5SX.

[**Note:** We hope to publish a major article on *tripunctaria* in the new year. Ed.]

Moths as commuters.

For those of us working in London and commuting by train from the Home Counties, travelling is usually a less than attractive feature of the day's toil. Aside from reading, there is little scope for entomological activity and, apart from a memorable occasion in 1980 when I captured (with some difficulty) a male *Palpita unionalis* Hübn. on a crowded train (*Ent. Rec.* **92**: 218), one hardly ever even sees an insect.

In recent months, I have become aware that some of my fellow travellers are, in fact, moths and that their number has been increasing, particularly during the last weeks of August. The opportunity to carry out a mini-survey became irresistible and on the 4th, 5th and 6th September 1989 I noted all visible moths from my vantage point in the end carriage of the early morning train that plies its trade between Tunbridge Wells in Kent, and Charing Cross in London. To my surprise, I logged 20 individuals of nine different species (more than in some of my autumn trips to Dungeness with an m.v.!).

The three-day score was as follows: *Agriphila geniculea* Haw. (3); *Emmelina monodactyla* L. (1); *Scopula imitaria* Hübn. (1); *Xanthorhoe fluctuata* L. (2); *Mythimna pallens* L. (2); *Agrotis segetum* D. & S. (1); *Noctua comes* Hübn. (2); *N. pronuba* L. (1) and *Phlogophora meticulosa* L. (7).

No doubt there is some dull explanation such as trains being left in sidings with their lights on and windows open, but might it be a trial of a new British Rail campaign, aimed at insects, whose slogan could be "Avoid that migration misery — let the train take the strain"? — PAUL SOKOLOFF, 4 Steep Close, Orpington, Kent.

A swarm of *Acentria ephemerella* D. & S. (= *nivea* Ol.). (Lep.: Acentropinae).

On 2nd August 1989, Mr Dennis O'Keeffe and I witnessed males and winged females of this species in enormous numbers at m.v. light. This was in the National Trust woods adjoining Scotney Castle, Kent. It is difficult to estimate just how many *A. ephemerella* were present, but the number probably exceeded 1,000. The vast majority were fluttering on the ground immediately outside the trap. Curiously, on a return visit to the spot on the night of 8th August, we failed to see a single *ephemerella* there, although both nights were warm and favourable for moths at light. — J.M. CHALMERS-HUNT, 1 Hardcourts Close, West Wickham, Kent BR4 9LG.

Immigrant Large White butterflies in Cornwall.

Mr D.L. Johnson, of St Minver, Cornwall, reported seeing about 1,000 *Pieris brassicae* L. within a small area near New Polzeath on the north

coast of Cornwall on 14th August 1988, the numbers dwindling to 300 - 400 after a few hours. As this now appears to have been an isolated immigration, with no coincidental large numbers reported even from the Scilly Isles, it seems that the butterflies made their first landfall there.

In his interesting article on the possible origin of migratory *Cynthia cardui* L. (*Ent. Rec.* **101**: 51), Dr D.F. Owen did not mention *P. brassicae,* but I wonder if this may add support to his theory. — Dr F.N.H. SMITH, Turnstones, Perrancoombe, Perranporth, Cornwall.

Convolvulus hawkmoth in Cornwall.

I was pleased to capture a perfect male *Agrius convolvuli* L. in my garden m.v. on the night of 4th September 1989. — W.G. KITTLE, 17 Trevarrick Road, St Austell, Cornwall.

The Microlepidoptera of Kent

I am collecting material for an account of the microlepidoptera of Kent, being a continuation of my *Butterflies and moths of Kent* and should be most grateful if entomologists would kindly send me their records. On publication proper acknowledgement will be given of all help received. — J.M. CHALMERS-HUNT, 1 Hardcourts Close, West Wickham,Kent BR4 9LG.

Killing, setting and storing butterflies and moths edited by **P.W. Cribb.** 19 pp. Paperback. AES Leaflet no. 28 (revised 1988). Amateur Entomologist's Society. £2.25.

The first edition of this useful publication appeared in 1956 and was revised in 1972. Much of the original material is unchanged, although some tidying up and modernisation had occurred. There must be a little unease in publishing a volume on killing and setting in these days of conservation, but the leaflet rightly acknowledges the place of collecting in the study of entomology.

A greater sense of concern stems from the recommended chemical agents for killing and degreasing. Safety precautions for killing agents are reasonably well dealt with, but modern concerns on the dangers of other agents are not properly reflected in the text. The highly corrosive properties of liquified phenol are not mentioned, and recommendations for the use of paradichlorobenzene and naphthalene are unqualified. Perhaps the most unfortunate advice is for the use of benzene in degreasing moths. Comments such as ". . . a quarter pint (of benzene) should wash 100 small or 50 large specimens . . ." is enough to bring any laboratory safety officer out in a cold sweat. Benzene should never be used by an amateur, and toluene should, with caution, be substituted.

Apart from these serious errors, the rest of the booklet is packed with sound advice on setting and storing, although the setting of micros is not covered.

Paul Sokoloff.

The moths and butterflies of Great Britain and Ireland, Volume 7, Part I. Butterflies. *Edited by* **A. Maitland Emmet** and **John Heath:** *Artists:* **Richard Lewington** and **Timothy Freed.** IX + 370 pages. 24 Colour plates. 22 Text figures. 83 Maps. Harley Books (1989). £49.50.

This latest addition to the series *Moths and butterflies of Great Britain and Ireland* is concerned solely with the butterflies. Volume 7 was originally to have included some moth genera also (Lasiocampidae-Thyatiridae) but these will now be dealt with in a separate part owing to the large amount of information available for the butterflies.

The book is dedicated to the late John Heath, the original editor of the series, who died before the completion of Volume 7. The publisher's foreword is largely a tribute to Heath; to his vision in initiating the series and his dedication to the production of subsequent volumes. But owing to Heath's increasing ill health from 1985 onwards most of the responsibility for Volume 7 fell, at an early stage, upon his co-editor, A. Maitland Emmet, who is also one of the 30 authors in the systematic section, and it is clearly Emmet's hand that is at the helm throughout most of the book.

The usual format of the series is used. Introductory chapters are followed by a systematic section where each species is given a detailed "write up" and after this there are references, plates and indices. As with any book of multiple authorship there is unavoidably some variation in standard but it should be stated at the outset that Volume 7 certainly reaches the high calibre of previous volumes in the series and in many ways surpasses them.

Chapter I on the vernacular names and early history of British butterflies describes the pioneering work of the fathers of entomology — Petiver, Ray, Albin and Wilkes: Harris, Lewin and Haworth, right down to Richard South's *Butterflies of the British Isles*, published in the early part of this century. By the time this latter work appeared some stability of the common names had been reached but a rich variety were in current use in the 17th and 18th century. Much emphasis is placed on Petiver's contribution to British entomology. It is interesting to learn that visits to London of Fabricius between 1769 and 1787 marked an important turning point in the nomenclature of British butterflies. Linnaeus published his *Systema Natura* in 1758 and Moses Harris used scientific names in the 2nd edition of the *Aurelian* (1775), but arranged them "as the spirit moved him or as artistic requirements suggested". It appears that it was only after Fabricius had popularised the Linnaean system that the random order of the *Aurelian* was replaced by Lewin's strict arrangement of family and specific names. This is a scholarly and informative chapter and makes interesting reading.

The next chapter deals with a more controversial subject entitled "Re-establishment of Insect Populations". A distinction is drawn in the opening paragraph between re-establishment and introduction, but in the

reviewer's opinion they have been treated largely as if they were the same thing. The authors are strongly biased towards introduction (in its broadest sense) and the various arguments against this activity are brought forth only to be demolished — sometimes with doubtful logic or consistency.*

The following section of this chapter finally moves onto firmer ground and there is a good concise description of the various ecological factors which influence butterfly populations. The chapter includes a section entitled "Examples of Introductions and re-establishment of British Butterflies" with an exhaustive account of the re-establishment of the Large Blue.

The main systematic part of the volume follows these preliminary chapters. A general survey of classification and a check list of British species leads on to detailed accounts of genera and individual species. These detailed accounts have been written by a number of different authors, each having a specific interest in, or research experience of, the butterfly in question. They follow the general format of previous volumes: description of imago (male and female and varieties), life history, including details of ecology and conservation needs; distribution (with dot maps for native species), and finally a section on the vernacular names and early history — enlarging on the introductory chapter on this same subject. In general these accounts are exceptionally well-written and some new and interesting facts are brought out — particularly with regard to life history and ecological requirements.

The descriptions of imaginal habits are particularly good, including mating behaviour, nectar source preferences, and forms of predation. More detail on former distribution would have been helpful in some cases, as the accompanying maps do not always tell the complete story. The account of *Carterocephalus palaemon* Pall. for example, is excellent overall but its interesting history and final demise in England, and its discovery in Scotland is covered by a few sentences only. The same applies to some other rare and localised species such as *Mellicta athalia* Rott. and *Eurodryas aurinia* Rott. A much more satisfactory system is that employed for the Large Blue, *Maculinea arion* L. where its six areas of distribution in former times are listed and discussed — with dates. Full information in this respect is also provided for *Satyrium pruni* and *Melitaea cinxia* L. and *Coenonympha tullia* Mull. The history of another well-known extinct resident, *Aporia crataegi* L. is given full treatment, a marked contrast to the short shrift given to *Lycaena dispar* Haw., where the reader is simply referred to previous papers on the subject of its demise in Britain. The

* For example an opposition viewpoint that distribution data are falsified is countered (among other ways) by the following: "when introductions are clearly documented, distribution maps can distinguish between them and natural occurrences". Unfortunately this has not been applied in all cases to the distribution maps in the systematic section of this book, where on page 236, regarding *E. aurinia,* the author states: "many current records are based on single sightings, or *for artificially established colonies*" (Reviewer's italics).

migrants and accidentals are dealt with in succinct and masterly fashion, and in some cases are accompanied by graded maps. There is a selective list of references and a glossary preceding the plates and the book concludes with good indices (General, Authors and Host plants).

The plates are a pleasure to write about for they are in general superb. As a butterfly illustrator Richard Lewington is already known from his illustrations of European butterflies in the Mitchell Beazley Guide. No artist I know has quite captured the intense indigo-purple of a freshly emerged *Apatura iris* L. but Richard Lewington gets as close as I have seen. His *Limenitis camilla* L. and all the Satyrids are simply exquisite. The only criticism I can find of this artist's work is on Plate 9, where, in the review copy at least, some specimens have a different colour tone on one half from the other. This certainly happens when looking at cabinet specimens of *Lysandra coridon* Poda, but somehow does not quite ring true in the plate. The *Lysandra bellargus* Rott. male and the Large Blue examples are also too highly coloured on this plate. There are one or two other points regarding the plates, but not the artist's work. On Plate 8: Figs. 1, 2 and 3 are labelled *L. dispar batavus* and Fig. 4, *L. dispar dispar*. These look as if the labels should be reversed; but if this is not the case, why allow only one half underside to illustrate this famous old English resident? Such cursory treatment is in marked contrast to the four plates at the end figuring adventive species which have, in my opinion, been given unwarranted space.

Some, with very little claim to anything other than accidental, have both sexes illustrated, upper side and underside, whereas our own native *Mellicta athalia* Rott., *Boloria euphrosyne* L., *Argynnis paphis* L. and several others have no female underside except as aberrations in some cases.

Some of the preceding comments may seem unduly negative, but as the publisher rightly states in his foreword, "A work of scholarship and authority has to stand close scrutiny, and the test of time". The first of these examinations is possible in a review, the second unfortunately is not. As a friend recently remarked to me, there should be two reviews for important books; one immediate and one after some time has elapsed in order to judge long term usefulness. It is my opinion that this volume will succeed on both counts. Its wealth of material and overall excellence of presentation make it deservedly the most important contribution to our knowledge of British butterflies since Frohawk. It is bound in green cloth, with a white dust wrapper illustrating butterflies from the four major families found in Britain.The paper is glossy and perhaps a little hard on the eye, but the type face is excellent. The price at £49.50 seems fair for a work of this quality.

C.J. Luckens

[Dr Luckens is correct in his observations on *L. dispar*. Overlays were transposed during production. Plate 8, figs 1, 2 and 3 are *L. dispar dispar* and fig. 4 is *L.dispar batavus*. — P.A.S.]

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TO OUR CONTRIBUTORS

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THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J.W. TUTT on 15th April 1890)

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SPECIAL INDEX

Newly described taxa (species, genera etc.) are distinguished by **bold type**. Taxa new to Britain or newly recognised as British are denoted by an asterisk.

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Edited by

P. A. SOKOLOFF

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